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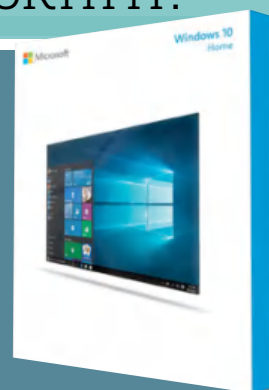
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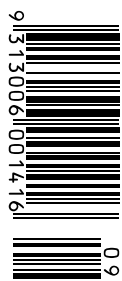
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Console gaming
for less



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New age toys for kids and
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01

ASHAMPOO PHOTO OPTIMIZER 5

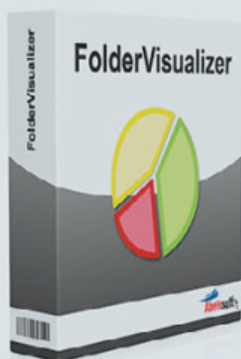
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02



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Future

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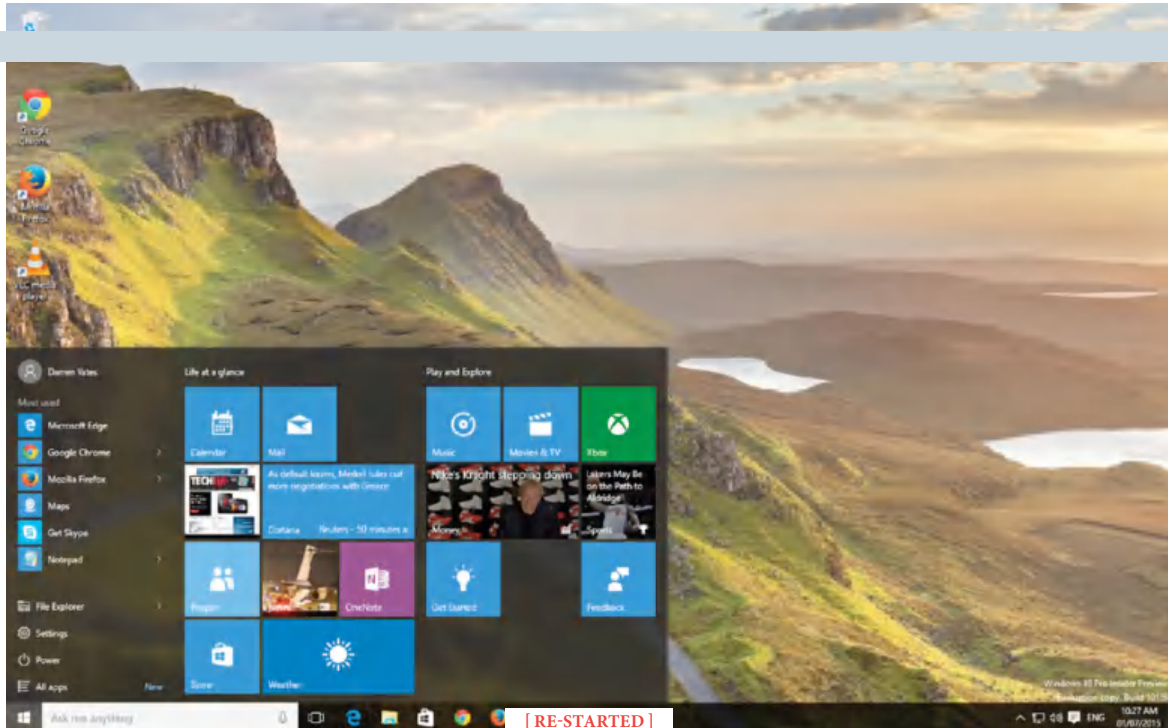
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EDITORIAL

UNFETTERED SPECULATION



Windows 10 has landed

AND *TECHLIFE'S* EDITOR RECKONS IT'S WORTH THE UPGRADE, ESPECIALLY FOR WINDOWS 8 USERS.

[DAN GARDINER]

WINDOWS 10 IS here. Yes, already. If, like me, you're thinking 'that was quick', it's worth noting that it's actually been over 2 years since Windows 8 launched. And the gap between Windows 8 and 10 launches has been roughly the same as between Windows Vista and 7 — and look how well that turned out in the end. Based on our tests with the preview versions, Windows 10 does indeed look like another winner. It undoes the mistakes of Windows 8, overhauls some outdated apps, and adds in some handy new features as well.

We'll have more on Microsoft's new OS in next month's *TechLife* (once we've had some time with the final build), but if you're tempted to jump in before then, we can't see a lot of reasons not to — particularly if you're running Windows 8 on a traditional desktop or laptop without touch capabilities. Because Microsoft's still chasing the tablet market — devices which run on lower-performance, low-power parts — the company's designed Windows 10 to be even more lenient on hardware than Windows 8 was, meaning it should run great on older PCs too.

Moreover, if you've been waiting on Windows 10 to upgrade to a new PC, you might not have to wait too long either. In the US at least, some Windows 10 devices have launched already from HP, and Dell will follow soon. We've got no concrete dates for Australian hardware arrivals, but with the PC

market still in a quagmire, we'd assume hardware makers will be very keen to capitalise on Windows 10's appeal.

GOODBYE WINDOWS PHONE?

It's not all good news in Windows land, however, with recent reports that Microsoft's significantly scaling back its smartphone division. The company's been throwing resources at the Windows Phone OS and at Nokia (which Microsoft fully acquired in April of last year) in the hope that it can catch up to iOS and Android — and apparently all for naught, as the OS's market share continues to shrink, with it now sitting at 3.2% globally.

Clearly something had to give, and Microsoft's decided to axe another 7,800 jobs (it cut a staggering 18,000 last year after the Nokia acquisition) that will come mostly from the Windows Phone division.

That doesn't mean that Windows Phone is suddenly going to disappear, however — Microsoft has deep pockets and doesn't plan on killing it off completely, but it does seem like it will be a significantly scaled-back operation. And we'll keep covering the OS and devices in *TechLife* as long as they remain interesting.

With ongoing rumours of Nokia building Android phones, however, Windows Phone's future isn't looking particularly healthy. ■



THE WALL

GUFF AND STUFF

[COME ON, HAVE YOUR SAY!]

We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to techlife@futurenet.com. All correspondence becomes the property of *TechLife* and is subject to editing. Letters must include full name, street address, suburb, state and phone number to be considered for print publication. Address and phone details will not be published.



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Presentations from a tablet

When will we see Bluetooth compatible or wireless projectors so that I can connect my iPad and give presentations from anywhere in the conference room? With technology today there should be no need to have to stand on the stage and use a laptop!

[GARRY MCGRAW]

Ed replies: Epson has a projector that does offer this functionality – the EB-1761W, which sells for around \$1,000 on the street. It has a dedicated app to let you control projector functions and presentations from an iOS device.

However, we reckon an even better solution might be to pick up an Apple TV and plug it into your existing projector via HDMI — this'll let you mirror your iPad's (or iPhone's) screen exactly, and will only set you back the cost of the Apple TV (about \$110), rather than having to pony up for an entirely new projector.

Android phone or tablet users should be able to use a Chromecast in much the same way...



Windows Media Center alternative

I have Windows 8.1 installed on my PC. At present I use Windows Media Center to watch free-to-air TV stations. I have an outside TV antenna connected to my

computer via my cable modem.

Windows 10 will not include Media Center. I was wondering if I install the new operating system, is there any software that may be available to allow me to keep watching TV on my PC.

[JAMES NUTT]

Ed replies: Your PC's TV tuner should theoretically have its own TV-viewing/recording software that works independently of Media Center — most TV-tuner makers will let you download the latest version from their web site.

That said, if it's a Media Center-like experience you're after, Kodi (kodi.tv), shown below, is your best bet. Formerly known as XBMC, Kodi's an all-in-one video/music/image media player that can optionally do TV recording — it even has a built-in EPG, just like Windows Media Center. It uses what's known as a '10 foot interface' which just means it's optimised for controlling via a remote control or gamepad — although it obviously still works if you just want to drive it with a mouse and keyboard. ■





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TELEPHONE LINE ACCESSORIES

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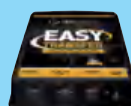
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HOTSPOT

YOUR GUIDE TO HOT NEW TECH



A colourful look at some of Apple Music's various features across multiple tabs.

[LISTEN]

Apple switches on music streaming

APPLE HAS FINALLY LAUNCHED ITS SPOTIFY-KILLER, WITH MIXED RESULTS.

[STEPHEN LAMBRECHTS]

WITH ITS US\$3 billion purchase of Beats Music last year, Apple laid down some serious cash in an attempt to take on Spotify. Streaming services have changed the way we listen to music, with the once-revolutionary iTunes method of selling digital audio files seeming quaint by comparison. If Apple was going to stay in the music distribution business, it knew it'd need to get with the times — which is exactly what the company's done with the launch of Apple Music.

Arriving in the form of an iOS update (sneakily putting itself in front of millions of iOS device users), Apple Music delivers an all-encompassing music service that doesn't just stream music — it's also an internet radio service (like Pandora), an Instagram-style social network for artists and fans, and a replacement for your old Music app that integrates your existing collection.

It's safe to say that Apple is attempting something huge with Apple Music, weaving all of its streaming content and social stuff into your existing music libraries and playlists. For the most part, Apple Music pulls it off, but there are a few quirks and issues that keep it from being the definitive streaming service that we've been waiting for. If Apple can continue to

refine and improve its app, we may even consider sticking with it past its free 3-month trial period; a monthly subscription costs \$11.99 for an individual user, or \$17.99 for a family of up to six users.

THE LEARNING CURVE

In order to get a feel of your music tastes, Apple Music first presents you with a group of bubbles with genres floating inside them. Select the ones you enjoy, and then move on to the next part of this 'setup' stage — choosing artists you like within these genres. You can repeat this process a few more times to help Apple Music figure out your tastes, but it only goes so far before it hits a wall.

Initially, Apple Music seems easy enough to get the hang of. The service's five sections are easily viewable along the bottom of the app. The first section, 'For You', is Apple Music's recommendation tab, with suggestions for a wide variety of artists, albums and curated playlists based off of the styles of music you chose during setup. 'New' is a section that resembles a traditional iTunes store, allowing you to browse new releases, new artists, top songs, genres, music videos and more. This



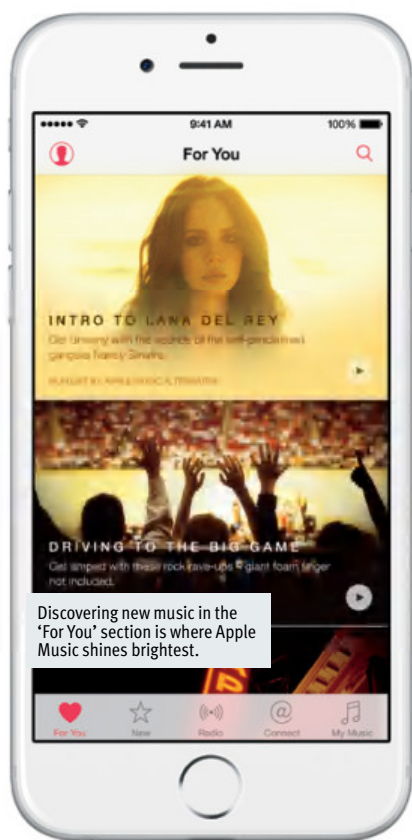
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(iTunes 12.2), Android
version in development.

“IT MAY HAVE BEEN NAIVE OF US TO THINK THAT WE’D BE ABLE TO STREAM MUSIC FROM APPLE’S ENTIRE ITUNES LIBRARY.”



section, along with For You, encompasses the best aspect of Apple Music — discovery. You can't help but find something new.

Radio is the next tab, which is home to Apple Music's live, 24-hour Beats 1 radio station. Here, you'll find big name hosts, such as Zane Lowe, spinning tracks and giving shout-outs to a global audience. The section also houses genre and

artist-specific stations that continuously play music. Next is Connect, a somewhat baffling inclusion that lets musicians market their music to you in an Instagram-like fashion. Thankfully, you can get rid of it entirely.

Finally, we have the My Music tab, which is where you'll find your music library. Any albums or playlists you had on your device prior to the update will be listed here, with streaming content and albums you've made available offline weaved into it. Initially, the My Music tab is where you'll find Playlists, which is confusing in that you have to flip between the two. Thankfully, disabling Connect in your device's settings will replace it with Playlists, separating the section into its own tab — it's the kind of option that is easily missed, but instantly improves your experience.

HEY APPLE, A LITTLE HELP?

Apple doesn't provide any kind of tutorial, so expect quite a bit of trial and error. For instance, finding an album or playlist and selecting 'Add to My Music' won't automatically show it to you in your My Music section — you'll have to go into the tab and deselect the 'Show Music Available Offline' option for it to appear, though annoyingly this will also make every song or album in your iCloud music library visible. Your other alternative is to download the album to your device, with the 'Make Available Offline' option, though doing this to a playlist will suddenly populate your library with dozens of individual albums for each song — it's a no-win scenario that needs to be addressed.

This much information crammed into small areas on various tabs seems to go against Steve Jobs' love of simplicity. Hopefully, Apple will continue to streamline its Music app.

And on the whole, the app has got way too much stuff going on in each of its sections, leaving it feeling cluttered, slow and somewhat confusing. Even weeks later, we're still learning new things about navigating and using the app. Quite frankly, it shouldn't be this difficult.

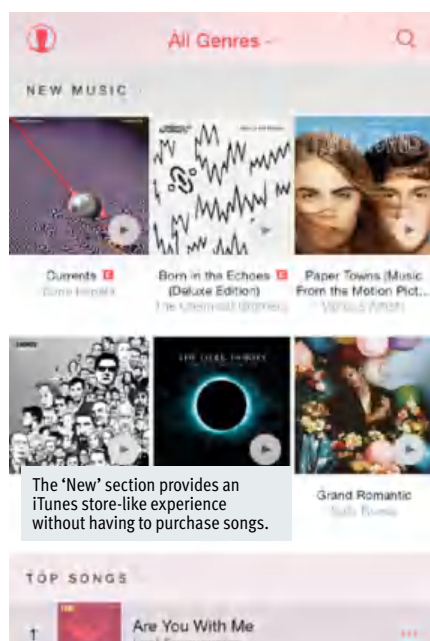
WHAT'S THE SELECTION LIKE?

It may have been naive of us to think that we'd be able to stream music from Apple's entire iTunes library, but that's how the service has been pitched for a while now. This would have easily given Apple Music the edge over its biggest competitor, Spotify. Instead, it has roughly the same number songs as its rival — 30 million, which is 13 million songs less than is actually available to purchase from iTunes.

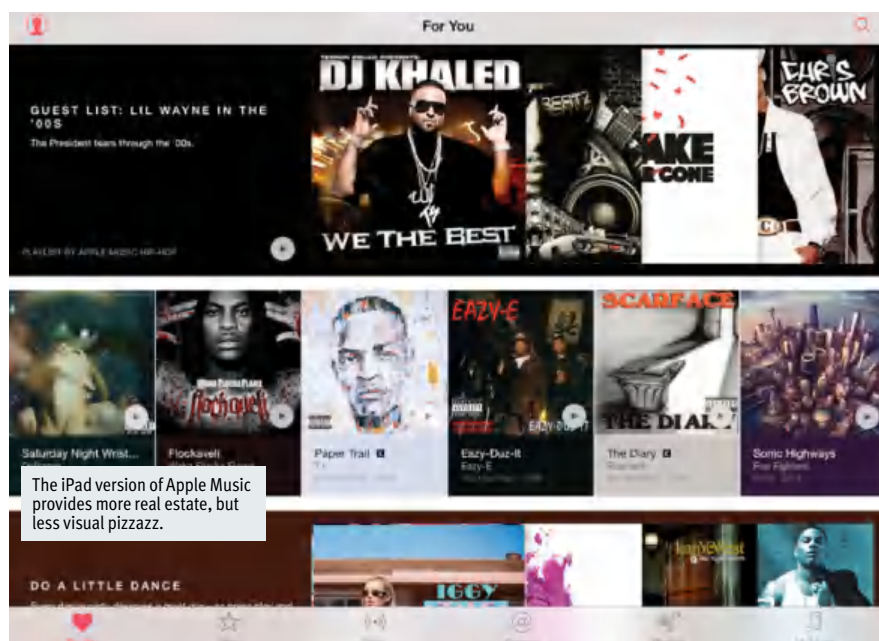
Sure, it's got Taylor Swift's latest album, but plenty of other stuff is missing. Soundtracks, for the most part, are either missing songs or completely absent, and don't even think about trying to stream The Beatles.

IS IT WORTH GETTING?

For everything that Apple Music does wrong, it does something very right. Discovering new music is the best it's ever been on a streaming service, and searching for specific genre or mood-oriented playlists is an absolute blast. For instance, searching for a specific song will often show you playlists that the song is included in, which opens you up to a world of similar music from other artists. Apple Music is really only let down by some strange design decisions. Our advice is to try out its free 3-month trial (though we suggest turning off automatic subscription renewals, an option buried deep in your account settings) and judge the service for yourself. ■



The 'New' section provides an iTunes store-like experience without having to purchase songs.



The iPad version of Apple Music provides more real estate, but less visual pizzazz.

[WATCH OUT]

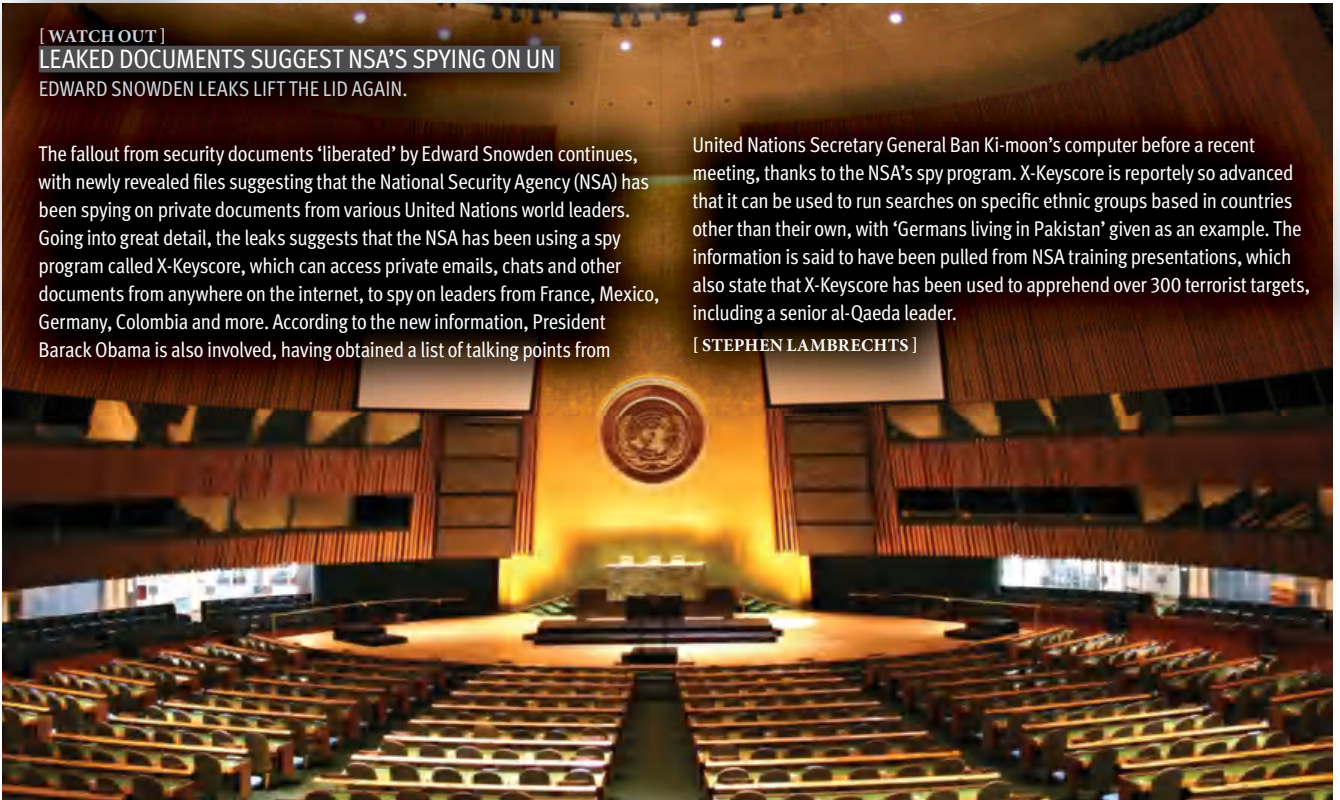
LEAKED DOCUMENTS SUGGEST NSA'S SPYING ON UN

EDWARD SNOWDEN LEAKS LIFT THE LID AGAIN.

The fallout from security documents 'liberated' by Edward Snowden continues, with newly revealed files suggesting that the National Security Agency (NSA) has been spying on private documents from various United Nations world leaders. Going into great detail, the leaks suggests that the NSA has been using a spy program called X-Keyscore, which can access private emails, chats and other documents from anywhere on the internet, to spy on leaders from France, Mexico, Germany, Colombia and more. According to the new information, President Barack Obama is also involved, having obtained a list of talking points from

United Nations Secretary General Ban Ki-moon's computer before a recent meeting, thanks to the NSA's spy program. X-Keyscore is reportedly so advanced that it can be used to run searches on specific ethnic groups based in countries other than their own, with 'Germans living in Pakistan' given as an example. The information is said to have been pulled from NSA training presentations, which also state that X-Keyscore has been used to apprehend over 300 terrorist targets, including a senior al-Qaeda leader.

[STEPHEN LAMBRECHTS]



MILLIONS OF SAMSUNG PHONES STILL VULNERABLE TO HACKING

IT'S STILL NOT SAFE TO USE PUBLIC WI-FI IF YOU HAVE A GALAXY PHONE.

In June, the Black Hat Mobile Security Conference in the UK was the bearer of bad news for Samsung, detailing a vulnerability occurring in over 600 million of the company's smartphones, including its latest flagship the Galaxy S6. It wasn't just a negligible, theoretical glitch either. The flaw could allow a hacker free reign on everything from the contents of text messages to relaying a feed from the device's inbuilt camera. Because the glitch stemmed from the integration of a third-party software keyboard created by SwiftKey, the popular swipe-typing app developer was unfairly adorned with at least partial responsibility. According to the researchers at Now Secure who uncovered the glitch (and who claim to have told Samsung about it close to a year ago), Samsung is really the only one to blame. The Korean smartphone maker has stated that it intends to roll out patches using its Knox security subsystem, but at the time of writing there was no indication whether these updates had been successfully implemented or not.

[JOEL BURGESS]



[VERSION 2.0]

Google Glass not dead!

VERSION 2.0 FOCUSING ON ENTERPRISE MARKET.

OK, SO WE can all admit that the first wave of Google Glass products failed to blow people's minds in the way that Google probably intended, but maybe there's a way to salvage this technology to appeal to people outside of the fedora-wearing crowd. Business is where people usually go to be successful, so it makes sense that Google would focus its Glass 2.0 line on this sector.

According to web site 9to5Google, the second wave of Google Glass products will be called Enterprise Edition (EE), and will be aimed at areas where it did find some success the first time around, such as healthcare and the private sector. This means that there's a chance that Glass 2.0 might not be available to individual consumers.

Patents lodged late last year suggest that the next version of the device is rumoured to be thinner and lighter than the original Google Glass, and there's also talk that Intel is involved in providing some of the internals.

[STEPHEN LAMBRECHTS]



[CASH GRAB]

More bad news for Dallas Buyer's pirates

DRAFT LETTERS SUGGEST INDIVIDUALS LIABLE FOR 'HUNDREDS, IF NOT THOUSANDS' OF FILM COPIES.

ANOTHER TWIST IN the ongoing *Dallas Buyers Club* piracy saga came in late June, as the Federal Court of Australia met to look-over the draft letters for broadband account holders who have been suspected of piracy. The letter makes it clear that rights-owner Voltage Pictures, will be pursuing the cost of the individual infringement in addition to legal costs and any 'additional damages'.

Much to Voltage Pictures dismay, both the draft letter and a suggested telephone transcript — for settling disputes outside of court — were required to be submitted to court.

Apart from reinforcing that an immediate settlement "will not be the same amount claimed by our client should this matter proceed to court", this transcript directs negotiators to explain that the damages pursued exceed the retail cost of purchasing

the film because "our clients are also out of pocket for legal and compliance costs [that] form part of the damage... to which they are also entitled to claim from you".

The transcript further suggests negotiators explain that "any file shared [through a BitTorrent application] is made available to hundreds, if not thousands of persons, thereby giving a potential claim for multiple copies of our clients work".

Though the documents don't explicitly cross the boundaries into speculative invoicing, they do leave open the option for the company to step into the legal shadows of a phone conversation, and use threats of expensive court proceedings as leverage to extract the highest settlement possible — which is exactly what the courts were trying to prevent in the first place.

[JOEL BURGESS]

[HELL NO, WE WON'T GO]
REDDIT IN REVOLT

SUBREDDITS GO DOWN AFTER STAFF MEMBER FIRED

EARLY IN JULY, close to 300 popular subreddits including AMA (Ask Me Anything), todayilearned and pics, went dark to the world following an internal protest against the dismissal of Reddit staffer: Victoria Taylor. Taylor was the only point of contact between reddit staff and Reddit forum moderators who volunteer their services to keep large forums like IAmA (I am a/an) running. According to karmanaut — one of the moderators of IAmA — on July 2nd, Victoria was dismissed by Reddit without consulting

any of the forum admins or providing a plan to bridge the lines of communication after her dismissal. In retaliation for the neglect (and in an attempt to send a message to Reddit's CEO Ellen Pao) a number of popular subreddits were set to private, effectively shutting down large chunks of the site. Though the company worked to repair relations and many of the forums were only offline for a day or two, interim CEO Ellen Pao eventually tended her resignation over the affair.

[JOEL BURGESS]



[BLIP]

REMOTE CONTROL RANGE ROVER
HOPEFULLY IT CAN'T BE HACKED.

UK car-manufacturer Jaguar Land Rover is reportedly testing a sport utility vehicle that can be manoeuvred by a smartphone application from anywhere within about three meters of the car. The remote controlled Range Rover feature will allow drivers to more accurately navigate difficult 4WD terrain or park the car in a tight spot from outside the vehicle.

[JOEL BURGESS]

[BLIP]

IINET SAYS THAT THE NBN IS TOO EXPENSIVE

NETFLIX THROWS A SPANNER IN GOVERNMENT'S BROADBAND BUSINESS MODEL.

iiNet chief executive David Buckingham has said that the arrival of streaming internet video services like Netflix have caused "6 to 12 months of [data] growth in six weeks" and that this unprecedented shift makes the NBN prohibitively expensive under the company's current wholesale pricing model. After crunching the numbers, iiNet's chief technology officer told Fairfax that consumers would be looking at an extra \$26 per month — on top of current monthly broadband costs — for downloading a 'moderate amount' of HD streaming video content over the NBN.

[JOEL BURGESS]

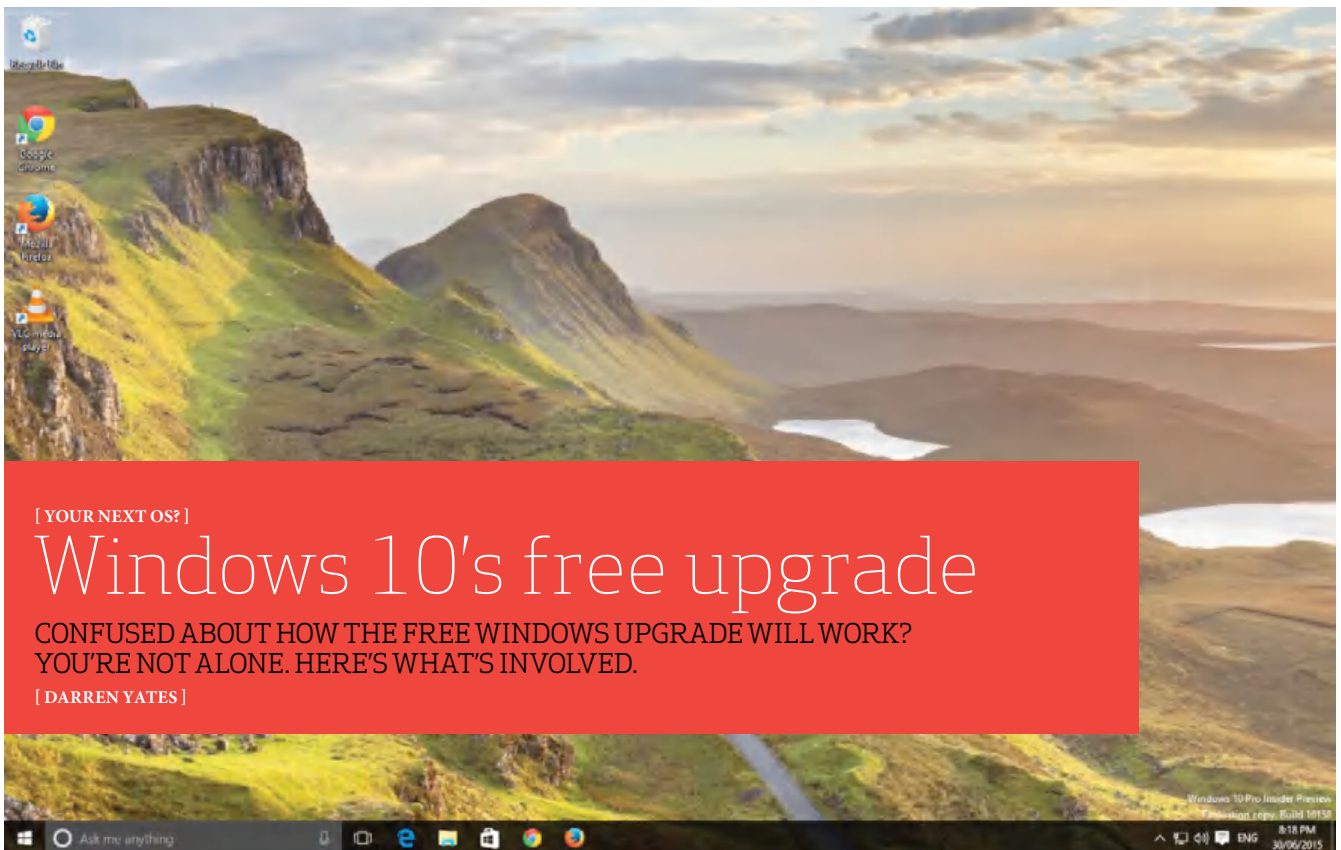
[BLIP]

SOUTH KOREA MANDATES BIG BROTHER APP FOR MINORS

SMART SHERIFF APP MONITORS ALL UNDER-19's SMARTPHONE ACTIVITY.

The South Korean government has passed laws mandating that children under 19 must install a copy of a parental monitoring app known as Smart Sheriff. Local telco companies will take the heat for not ensuring the proliferation of this controversial Android app, which monitors everything from text messages to internet searches. The app not only logs user location but also flags the use of keywords like 'suicide', 'pregnancy' and 'bully' to parents.

[JOEL BURGESS]



[YOUR NEXT OS?]

Windows 10's free upgrade

CONFUSED ABOUT HOW THE FREE WINDOWS UPGRADE WILL WORK?
YOU'RE NOT ALONE. HERE'S WHAT'S INVOLVED.

[DARREN YATES]

UNFORTUNATELY, MICROSOFT HASN'T made a great fist of explaining how the free Windows 10 upgrade will work and given the emails we've received from readers, it seems there are still more questions than answers. So, here's what we know so far:

WINDOWS XP, VISTA

There is no upgrade path from XP or Vista to Windows 10. But, word is that if you've sign up to Microsoft's Insider Program with a valid Microsoft account, clean-installed the latest Windows 10 Preview Build from an ISO image and — most importantly — continue in the Insider Program after July 29, it seems Microsoft will for all intents and purposes allow you an on-going Windows 10 install. You'll, of course, have to put up with bugs, fixes and, in all likelihood, Microsoft monitoring, but it's one way to get ongoing pre-release beta-grade Windows 10 for free (tinyurl.com/p8z5uhn).

WINDOWS 7, 8.1

If you have a genuine-licensed Windows 7 or 8.1 install that isn't the Enterprise edition, you should qualify for a free final-release upgrade. Aside from any hardware incompatibilities preventing upgrading, it'll work like this — users with Windows 7 Starter, Home Basic or Home Premium or Windows 8.1 will get Windows 10 Home; those on Windows 7 Professional or Ultimate or Windows 8.1 Pro, Pro Student or Pro WMC will upgrade to Windows 10 Pro.

However, all upgrades will need the following:

- * 3GB of download bandwidth
- * Windows 7 SP1 or Windows 8.1 updates preinstalled

- * Windows Update enabled
- * You must apply the upgrade within one year

IS THE UPGRADE FREE OR NOT?

This last point has caused some to think after one year, the free upgrade will become a subscription fee. It's not to say Microsoft won't have Windows-as-a-Service sometime in the future, but on current info, if you have what Microsoft considers a 'genuine' licensed install of Windows 7 SP1 or 8.1, the upgrade will be freely available to download for one year, but the upgraded installation will remain free to use for the life of the device.

While the Preview Builds have been made available as ISO images, we have no word that the free final-release upgrade will be available this way — but it's possible.

UPDATE BEFORE YOU UPGRADE

If you haven't updated to the latest versions of

Windows 7 SP1 or 8.1, you must do so before the Windows 10 upgrade can begin. We've been asked if you can install Windows 8.1 fresh from install media and use a Windows 8 key. The answer is typically 'no' — you need a Windows 8.1 key. However, there may be (complicated) ways around this — we don't have space to cover it here, but check out this HowToGeek tutorial (tinyurl.com/mjppzab).

GET WINDOWS 10 ICON

Finally, noticed the new 'Get Windows 10' icon in your system notification tray? One reader feared accidentally clicking on it would lock-in the upgrade. It doesn't — it just launches the upgrade offer app. You have to click the 'Reserve your free upgrade' button, then enter your email address in the app window before anything happens. ■

↓

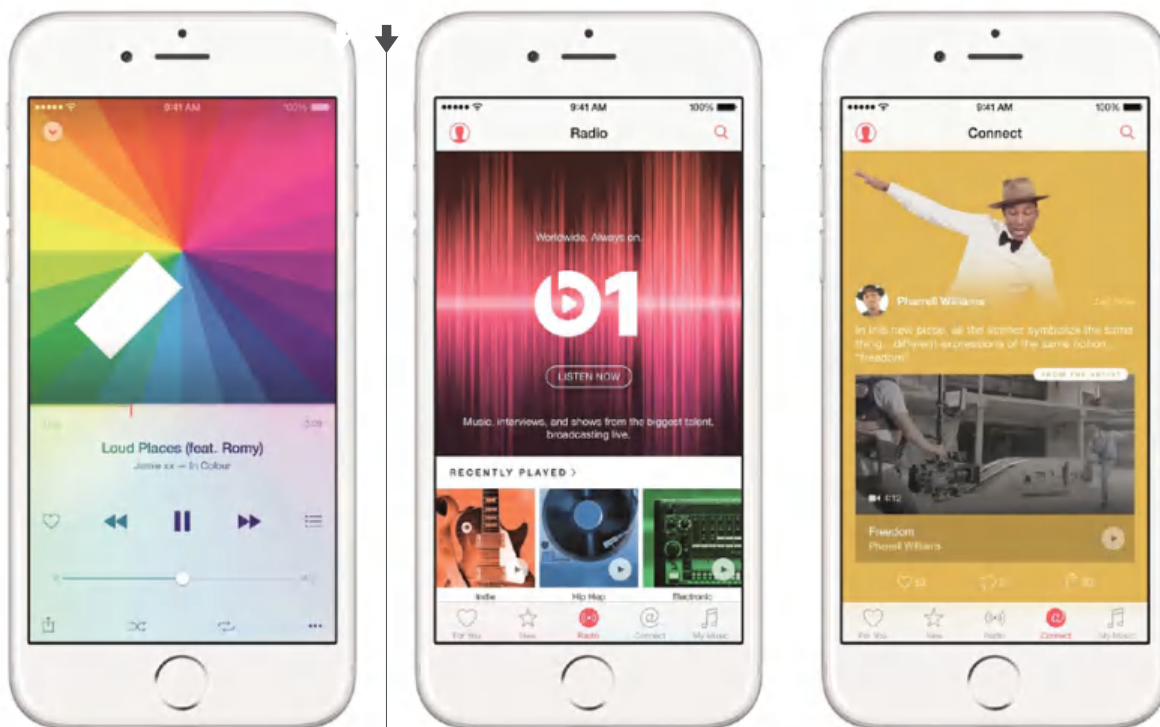
Upgrade from Windows 7*

From Edition	To Edition
Windows 7 Starter	Windows 10 Home
Windows 7 Home Basic	
Windows 7 Home Premium	
Windows 7 Professional	Windows 10 Pro
Windows 7 Ultimate	

↓

Upgrade from Windows 8**

From Edition	To Edition
Windows 8.1***	Windows 10 Home
Windows 8.1 Pro	Windows 10 Pro
Windows 8.1 Pro Student	
Windows 8.1 Pro WMC	
Windows Phone 8.1****	Windows 10 Mobile



1%

REVENUE AN ANALYST SAYS APPLE MUSIC TO CONTRIBUTE TO COMPANY EARNINGS.

According to Gene Munster, analyst at the US investment bank Piper Jaffray, Apple Music is only likely to contribute around 1% of Apple's overall revenue in 2016. The estimated figure of US\$1.8 billion is based solely on whether Apple Music can match Spotify's current subscribership of 15 million users, though that's unlikely, according to Munster. While this is hardly a blip on Apple's radar, Munster suggests the real goal is to sell more iPhones. [SL]

1,425%

POTENTIAL RETURN ON INVESTMENT FOR CYBERCRIME.

Business security firm Trustwave has calculated the hard figures of cybercrime and shows that it does pay, and it pays well. Ransomware — whereby your computer's files are encrypted by an external source and then literally held to ransom under threat of deletion — is on the rise, and although a would-be attacker may spend \$5,900 a month on costs for hardware and encryption, they stand to make \$90,000. The figure was based on 20,000 visitors per day over a month-long campaign, a 10% infection rate and a 0.5% payout rate. Solution? Back up your computer, yesterday. [PT]

US\$500,000

THE PRICE OF WIKIPEDIA AS A HARBACK BOOK.

It'll be 7,600 volumes large, will take two weeks alone to upload to on-demand printer Lulu.com and is, as described by artist Michal Mandiberg, a "half utilitarian data visualisation project, half absurdist poetic gesture". It's the English language version of Wikipedia as a book. However, Mandiberg doesn't intend to print out every volume: "We don't need to see the whole thing in order to understand how big it is," he says. [PT]

The news in numbers

A QUICK LOOK AT THE NUMBERS DRIVING THE BIG TECH STORIES.

[JOEL BURGESS, STEPHEN LAMBRECHTS AND PAUL TAYLOR]

58%

REVENUE APPLE WILL PAY MUSIC PUBLISHERS FROM APPLE MUSIC SUBSCRIPTIONS.

Apple Music has arrived on the streaming music scene, with many curious about how the Cupertino company will divvy up its profits amongst rights holders. It's been announced that record labels will receive 58% of Apple Music's revenue, with Apple holding on to 30% and artists receiving the remaining 12%. Users can sign up for a 3-month free trial, with Apple paying labels and artists their dues out of its own pocket during the period. [SL]

US\$24,000,000

A BOOK'S PRICE ON AMAZON GOT AMAZINGLY INFLATED.

A pricing war between two sellers on Amazon.com has seen a textbook about genetics reach the unprecedented price of US\$23,698,655.93 (plus \$3.99 shipping and handling, of course). The book, *The Making of a Fly* by Peter A. Lawrence, had an original retail price of US\$100, but became heavily inflated when an algorithm-based pricing system caused both sellers to automatically raise the price of their items based on the other seller. [SL]

The Making of a Fly: The Genetics of Animal Design (Paperback)
by Peter A. Lawrence

Return to product information

Always pay through Amazon.com's Shopping Cart or 1-Click.
Learn more about [Safe Online Shopping](#) and our [safe buying guarantee](#).

Price at a Glance
List: \$70.00
Price: **Used: from \$35.54**
New: from **\$1,730,045.91**
Have one to sell? [Sell yours here](#)

Price + Shipping	Condition	Seller Information	Buying Options
\$1,730,045.91 + \$3.99 shipping	New	Seller: profnath Seller Rating: ★★★★★ 93% positive over the past 12 months. (8,183 total ratings) In Stock. Ships from US, United States. Domestic shipping rates and return policy. Brand new, Perfect condition, Satisfaction Guaranteed.	Add to Cart or Sign up to turn on 1-Click ordering.
\$2,198,177.95 + \$3.99 shipping	New	Seller: bordeebook Seller Rating: ★★★★★ 93% positive over the past 12 months. (125,391 total ratings)	Add to Cart or Sign up to turn on 1-Click ordering.

[CROWDFUNDED]

Kickstarted!

Aug
2016Dec
2015

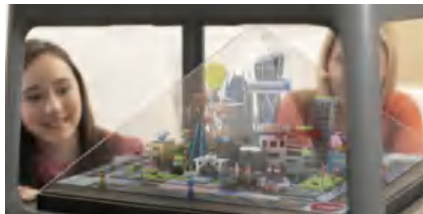
FROM THE PRACTICAL TO THE QUIRKY TO THE DOWNRIGHT STRANGE, CROWD-FUNDING WEB SITES HAVE ALLOWED THE CREATION OF AN AMAZING RANGE OF PRODUCTS. HERE'S A SELECTION OF LATEST PROJECTS THAT PIQUED OUR INTEREST.

[JOEL BURGESS]

[3D-2D]

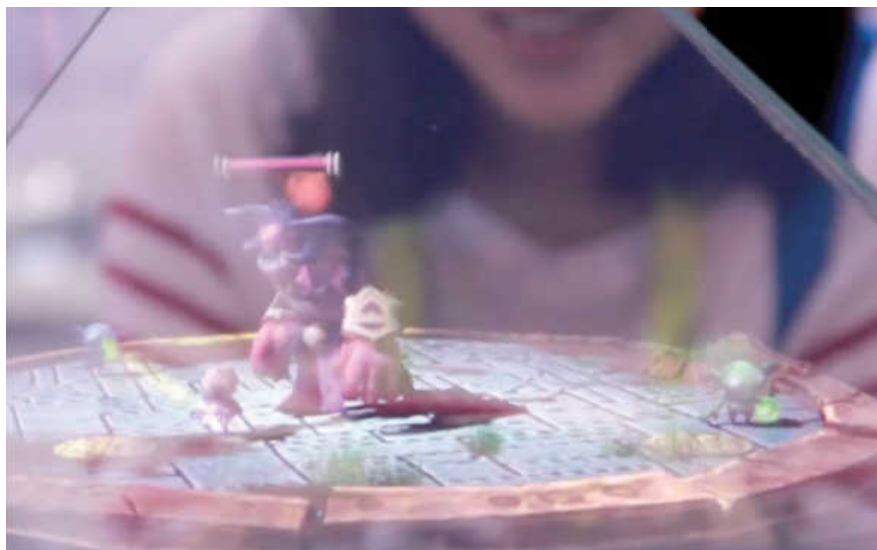
Holus

hplustech.com | Initial Goal: CA\$ 50,000 |
Raised: CA\$295,000 from 482 backers | RRP: TBD



The world of virtual reality is taking leaps and bounds towards becoming commonplace, but this Kickstarter believes that the 3D world created through VR headsets is overly solitary and wants to offer a more social 3D experience by bringing holograms into the modern living room. Holus is a four sided glass pyramid that creates the illusion of 3D by projecting images down onto the pyramid which then reflects the

image out to the viewer, creating the illusion of a 3D object in the prism. The Holus does offer depth perception but it isn't the interactive 3D that is offered by some VR headsets. That said, it can project four distinct angles of an object on its various faces. Despite seeming like a limitation this aspect is likely Holus' greatest strength, as it will be significantly easier to adapt existing content to this platform.



[SAD TROMBONE]

Failed Kickstarter of the Month

NOT EVERY CROWD-FUNDED PROJECT ACTUALLY GETS OFF THE GROUND.

[NICE IDEA]

GREEK BAILOUT FUND

tinyurl.com/tla41-greek | Funding Goal: €1.6B |
Raised: €1,930,577 from 108,654 backers

We have to admit that the crowd funding campaign to waver Greece's crippling debt was worth a shot, even if it did only raise less than 1% of its funding goal. That's not to say there wasn't a lot of interest in this campaign, in fact, that there was so much it actually crashed Indiegogo on its opening night. The Greek Bailout Fund also managed to raise close to €2 million from over 100,000 backers, which puts it somewhere in



the top 40 grossing crowdfunding campaigns ever. But the campaign needed 800 times that amount (or €200,000 per minute) to actually be successful. The bar was set absurdly high, but like we said, it was still probably worth a try.

6h 9h 3.5g

dot

Bluetooth

compatible with

[CROSS YOUR T'S AND DOT YOUR EARS]

DOT

sospeciallabs.com

Initial Goal: US\$30,000 | Raised: US\$100,000+ from 1,132 backers (29 days to go) | RRP: US\$149

OK so Dot isn't the first in-ear Bluetooth headset to grace a crowdfunding platform, but the devs are pushing it as the smallest and the most affordable. Considering you can get a pair for US\$89 before August 5th through the Kickstarter, it's not surprising that this punctual little package is attracting some attention. Dots sync wirelessly with your phone and have both a microphone and a single versatile button that can do everything from answer a call to pause your music. So Special Labs has also set itself the ambitious deadline to begin shipping them in time for Christmas — just don't expect them to fill your stocking.

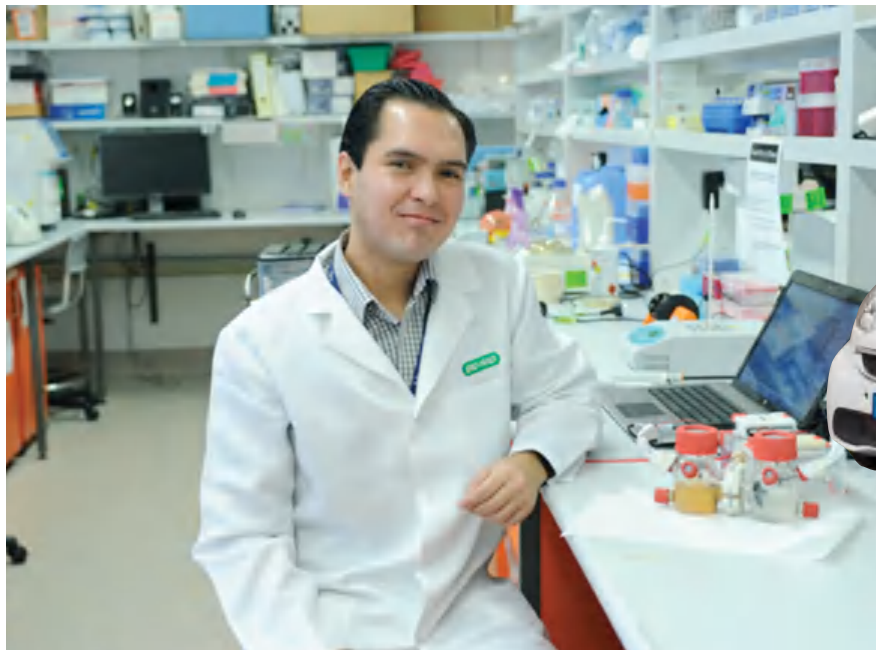
Feb 2016

KOKOON HEADPHONES

tinyurl.com/tla41-kokoon

Initial Goal: US\$100,000 | Raised: US\$1,678,000 from 7,372 backers | RRP: US\$319

There's nothing better than falling asleep to a new album or audiobook, but unless you set a timer, being woken up in the middle of the night by obtrusive headphones or the fifth repeat of a song tends to outweigh the benefits. But this Kickstarter may just have the solution: wireless, pillow compatible, auto dimming headphones. Everything about these ear-clams has been designed with comfort in mind. The components were pushed up into the headband to allow for the low-profile, over-ear speakers and the team spent a lot of time working out an air circulation system that prevented sweatiness but didn't break the headphones acoustic seal. Then there's the fact that they have in-built EEG brainwave monitors, so the headphones can determine when you're asleep and turn themselves off.



[I F&%\$#@* LOVE SCIENCE!]

Pop science

WHEN THE GEEKS INHERIT THE EARTH, THESE SCIENCE-BASED DISCOVERIES WILL AT LEAST MAKE IT A FUN PLACE TO BE!

The Matrix got it wrong

HUMANS DISCOVERED MAN-POWERED BATTERIES FIRST.

DANIEL ROXBY OF UTS's Centre for Health Technologies (above), is working on a battery for pacemakers and deep brain stimulators that is powered by the human body. Using microbial fuel cells and harnessing natural glucose found in the body, Roxby and his research team hope

to appropriate an established technology to relinquish the need for battery replacement surgery. The project is still in its early stages, but the team have reported some success in using a prototype to power a simple circuit.

[JOEL BURGESS]



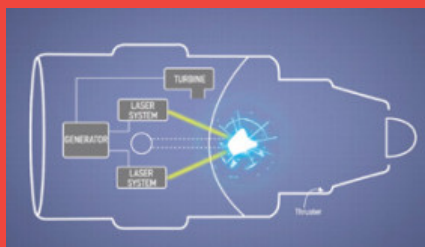
HOTSPOT
POP SCI

Robocabs 94% better for the environment

SCIENTISTS ESTIMATE SIGNIFICANT REDUCTION IN GREENHOUSE EMISSIONS.

With Google already testing its driverless cars in a number of states in the US — and announcing that they will be available to the public in the next 5 years — robocabs are just around the corner. And considering transportation accounts for 62% of the world's petroleum consumption and 13% of the total global greenhouse emissions, for greenies (and techies) they couldn't come soon enough. A research paper recently published in journal *Nature Climate Change* estimated that robocabs could reduce light vehicle emissions in the US, by up to 94%.

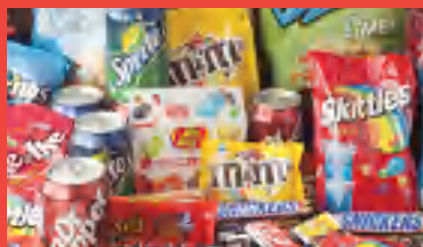
[JOEL BURGESS]



BOEING JUST PATENTED A NEW ENGINE IT'S POWERED BY LASERS AND NUCLEAR FUSION.

OK, it might sound like something Dr Evil would request from his minions, but this laser powered propulsion system was submitted to the US patent office in June by none other than renowned engine manufacturer Boeing. The propulsion system is a little complex involving shooting high powered lasers at either Deuterium or Tritium which causes a fusion reaction, a lot of heat and a rapid expulsion of either hydrogen or helium (which pushes the jet forward). The system then harnesses the thermal energy to recharge the high powered lasers.

[JOEL BURGESS]



I QUIT SMARTNESS

DOES A HIGH-FAT, HIGH-SUGAR DIET MAKE YOU DUMB?

Does an unhealthy diet affect your mind as well as your body? According to researchers at Oregon State University, that may be the case. A four week study found that a high-fat or high-sugar diet caused a decline in the cognitive functions of its subjects. According to Scientist Kathy Magnusson, the study's findings suggested that "It's not just the food that could be influencing your brain, but an interaction between the food and microbial changes."

[STEPHEN LAMBRECHTS]



IN THE STARS

IT'S NOT ASTROLOGY: THE MONTH YOU'RE BORN CAN HAVE LIFELONG EFFECTS.

While astrology has always been considered by many as a pseudoscience, there may be more to the month you were born than was previously accepted by scientists. New research out of Columbia University suggests that your birth month may be an influence to the diseases you develop throughout your life. Patients over a 100-year period were statistically analysed, with a correlation found between birth month and up to 55 diseases, including asthma, ADHD, eyesight and more.

[STEPHEN LAMBRECHTS]

LIFETOOLS

ENHANCE YOUR LIFE WITH TECH

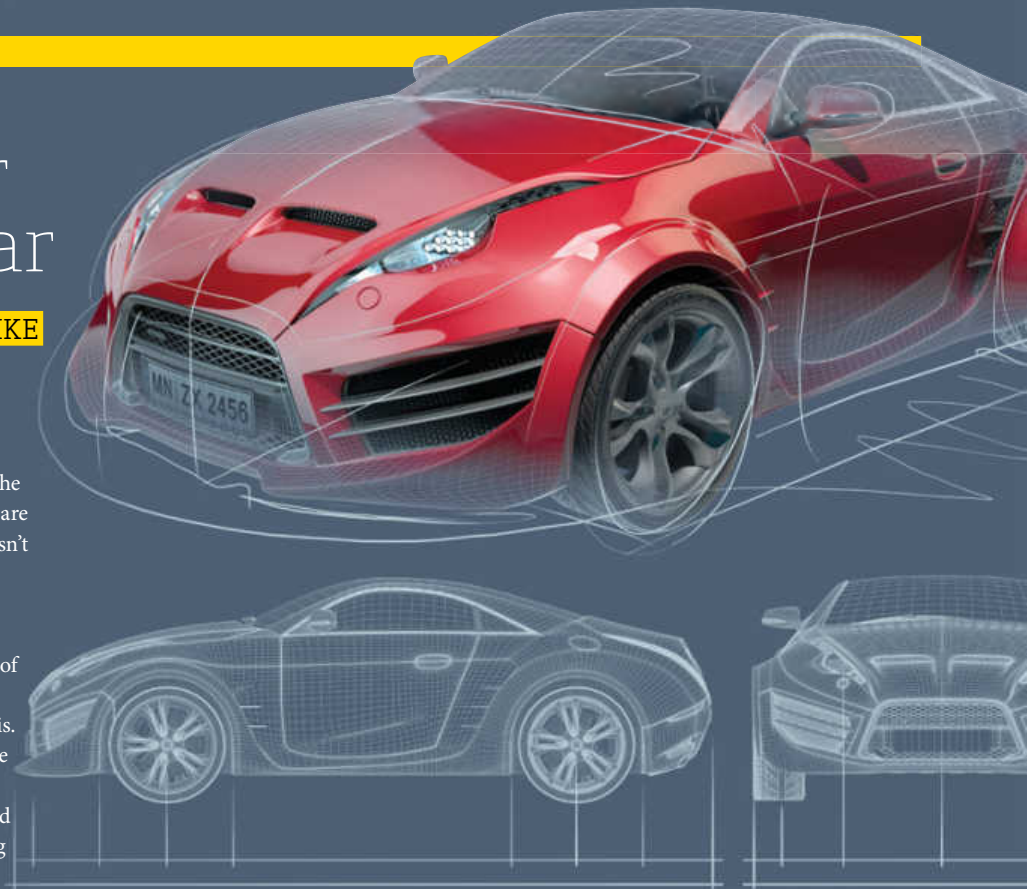
[SPARK UP YOUR GREY MATTER]

Lifetools for a smarter car

MAKE YOUR RIDE FEEL MORE LIKE BOND'S ASTON MARTIN.

[JOEL BURGESS]

DESPITE THE FACT that Google wants you to believe that cars will be driving themselves in the next few years, for most of us, self-driving cars are still a long way off. But having an older car doesn't mean you have to miss out on all the latest automotive tech innovations. Thanks to a somewhat surprising synergy between smartphones and dumb cars, there's a long list of ways that your modern pocket computer can make your car become more high-tech than it is. Whether it's being able to stream your favourite podcast or getting feedback on engine performance, there's plenty of gadgets, apps and web sites that you can use to make your driving experience more modern.



[GADGETS]

Drinkmate

YOUR NEW DRINKING BUDDY.

US\$29.99 | getdrinkmate.com

Drinkmate was a successful Kickstarter campaign that raised close to US\$100,000 at the end of last year. This tiny blood-alcohol detector currently only works with Android smartphones, but you can pre-order an iOS breathalyzer that will launch sometime this year. This isn't the only smartphone-connected blood-alcohol-content reader out there, but it is one of the smallest and it uses your smartphone's battery for power — so you don't have to worry about recharging it.



GoFar

A CAR-DATA GOPHER.

\$149 | gofar.co

This spaceship-looking gadget kicked its \$50K funding goal after only 50 hours and pushed to reach over three times that by the campaign end. Designed by an Australian start-up using the engine computing electronics of rocket-tracking technology, GoFar helps you tap into your car's data stores to find the perfect balance between power and economy. A simple blue/red light indicator sits on your dashboard and lets you know when you're wasting petrol or short changing yourself on power. GoFar will save you between 13-22% from your regular fuel use.



Navdy

UPGRADE TO A COCKPIT.

Pre-order US\$299; RRP, US\$499 | navdy.com

Navdy is a transparent heads-up display that sits in your line of sight while driving and displays both car and smartphone information where you want it. With iOS and Android-compatible apps, Navdy will not only give you speed and direction feedback, it'll also push through notifications and display incoming calls. An inbuilt camera allows you to use hand gestures to interact with the device, and the microphone and speakers mean that you can ask it to read out your SMSs and dictate responses. This little device is still in the pre-order phase, but intends to ship in 2015.



[WEB SITES]

DASHCAM OWNERS AUSTRALIA

THE BEST BAD-DRIVING SHOW-REEL.
dashcamownersaus.com.au

Apart from having one of the most regularly entertaining (or frightening — depending on the video) YouTube channels in Australia, this web site also contains useful reviews on some of the best dash-mounted cameras money can buy. With numerous videos racking up over 100,000 YouTube hits and more than 16,000 regular subscribers, this user-uploaded hub catches some of Australia's worst drivers and it'll hopefully make people think twice next time they're tempted to do something risky on the road.



CHOICE

LAY OF THE CAR LAND.
choice.com.au/transport/cars

Choice may not be the first site that comes to mind when thinking about your car, but with car reviews, insurance price comparisons, eco-friendly car model roundups, tyre reviews and car safety specs it's a handy little resource to have. On everything from finding the right dog seat belt to warning you of car repair scams, Choice has a lot to offer when it comes to automobiles.

iStabilizer

FINALLY, A BALANCED DASH MOUNT.
\$39.99 | tinyurl.com/TLA41-iStab

A smartphone mount for your car is one of those essentials — so necessary that you might be tempted to just run out and buy one without doing any research. But buying a good one can save a lot of grief, and iStabilizer has shown that you don't have to pay a fortune to get a better-quality car mount with some nice additional perks. iStabilizer not only clicks onto your windscreen — putting your phone in the most accessible position possible — but it also has the added stabilization features so you can easily see it at any point.



MOTORMOUTH

ALMOST AS CHEAP AS SYPHONING...
motormouth.com.au

Fuel prices fluctuate a lot and though it may not feel like the biggest deal paying a few cents more on each litre of petrol, just a little effort could save you a lot over the course of a year. If you're keen to save petrol more generally, Motormouth also has a bunch of useful tips to help you scrape even more from the barrel and if you need some help working out your car's fuel economy this web site can do that for you too.



DRIVE AUSTRALIA

A CRYSTAL BALL FOR ROAD-TRIPPERS.
tinyurl.com/TLA41-Route

Getting out on the open road in Australia is probably one of the biggest pluses to living on a sparsely-populated, continent-sized island. And what better to inspire such a trip than an in-depth list of the best roads Australia has to offer. Drive Australia has collected the best over-200km road trips from each state and has amassed it into one ranked list of the best 100 routes for your next tar-paved holiday.

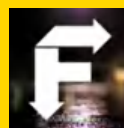


[ANDROID, IOS]

PLUGSHARE

FIND THE NEAREST ELECTRICITY PUMP.
Free | plugshare.com

If you happen to be one of the lucky few Australians who've already got their hands on an electric car, you've probably sussed out the local service stations that can recharge your batteries. But for anything longer than just ducking to the supermarket, you're probably not going to be as aware of your options. PlugShare is an interactive map that shows all the service stations that offer car-recharging services, with supplementary info on the charging speed and connection type.

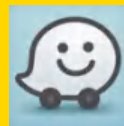


[IOS]

FIND MY CAR SMARTER

THE DUMB VERSION REQUIRED ORIENTEERING SKILLS.
Free | findmycarsmarter.com

If you've ever spent hours looking for your car or received a parking ticket because you forgot how long you were able to park in a space, Find My Car Smarter may be the app for you. This freemium app allows you to set a marker when you park your car — freeing your mind up for more important things — and you can also set a timer to make sure you're back before you're surprised by a parking ticket.



[ANDROID, IOS, WINDOWS PHONE]

WAZE

FIND 'WAZE' AROUND OBSTACLES.
Free | waze.com

Built off the back of info provided by its users, Waze points out traffic, accidents, road works, police, road closures and speed cameras, on top of allowing a full range of social features like Map Chat, Foursquare Checkin Rewards and tips on good fuel prices. It doesn't pretend to be the best GPS navigator out there — actually it doesn't have any direction utilities in Australia — but it is pretty good at keeping tabs on the status of the road.



[ANDROID, IOS, WINDOWS PHONE]

SPOTIFY

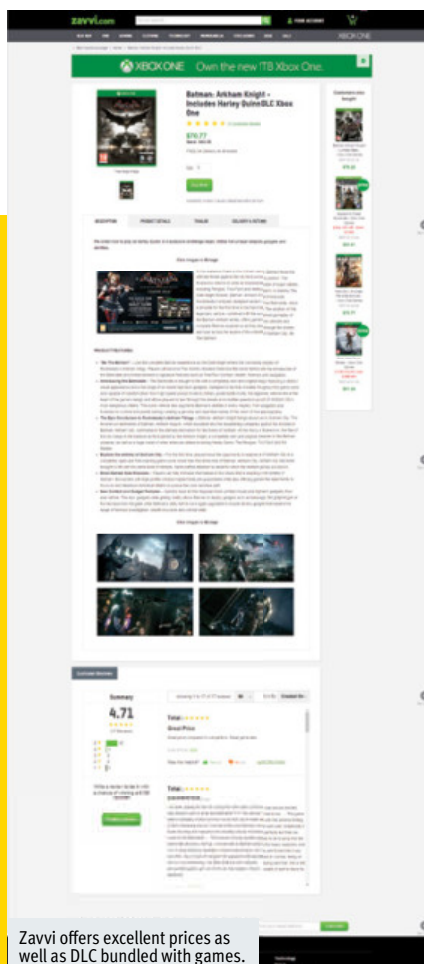
THE MODERN EQUIVALENT OF A 'WIRELESS'.

Free limited option; Premium subscription, \$11.99/m | spotify.com/au/

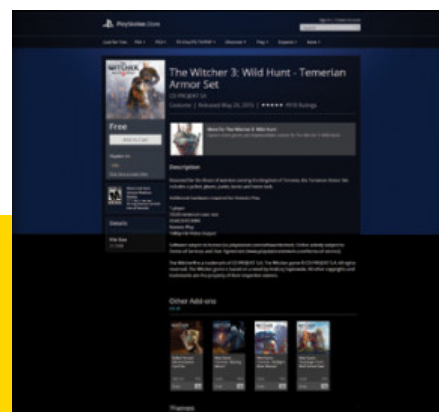
Since the launch of Apple Music, there are a few music streaming apps to choose from and although apps like Spotify, Pandora and Guvera are all good generally, where they excel is in the car. Being able to put on a curated playlist and let it run its course is one of the most satisfying ways to find new tracks. That said, doing this on a regular basis is going to require either a hefty amount of mobile data (if you're using the free option) or a premium subscription (which lets you save tracks to your mobile device). So use it carefully. ■



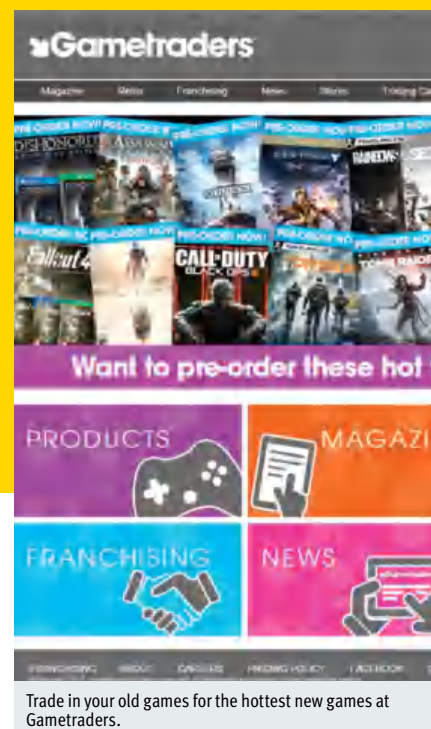
Compare Games displays the price for games from a number of online retailers.



Zavvi offers excellent prices as well as DLC bundled with games.



DLC for *The Witcher 3: Wild Hunt* features everything from a beard and hairstyle set to additional quests and impressive new armour.



Trade in your old games for the hottest new games at Gametraders.

[BARGAIN HUNTER]

Console gaming for less

DON'T PAY FULL PRICE TO GET YOUR ENTERTAINMENT FIX.

[OLGA JEVDIC]

FOR MANY, CONSOLES are the way games were meant to be played — on your big-screen TV and from the comfort of your lounge room sofa. For starters, they're machines specifically built for that purpose, plus games are often designed with consoles in mind, so PC ports of some titles can often be buggy and lack the immersive qualities of their console counterparts. There are also a number of games that are exclusive to consoles, such as *Halo 5: Guardians* for the Xbox One.

Regardless of which particular console is your gaming platform of choice, they all have one thing in common: they're more expensive than the PC versions. For this reason alone, it pays to shop around.

In the July issue of *TechLife* (see page 20), we looked at buying PC games on the cheap. And since most of the web sites we mentioned also sell console games, we'll be covering some familiar ground here.

PRICE COMPARISON SITES

When you're on the hunt for a game, our favourite price comparison web site, Compare

Games (www.comparegames.com.au), should be your first stop. It looks at a number of local and international retailers to find you the cheapest price for your chosen games, and it even includes the cost of shipping, so you won't get any nasty surprises. Not only that, but if there's a discount coupon available for a particular store, Compare Games will list that too. Retailers include EB Games, Play Asia, JB Hi-Fi, Amazon, 365Games and more.

It's common practice for retailers to lower the price of games the longer they've been on sale. If you don't mind waiting to play the latest games, your patience will almost certainly net you a discount. To this end, you can submit your email address to have Compare Games notify you of a price drop on your chosen game.

GAMES RETAILERS

As we said before, we looked at these sites in detail in the July issue, so we'll recap briefly here. Because games are expensive (a brand-new PS4 game could set you back around \$100 retail on average), online stores with bricks-and-mortar shopfronts that offer trade-ins and



Expect to see game announcements and teasers of the latest games as this year's Comic-Con.

NEW GAMES & CONTENT

As we went to press, San Diego Comic-Con 2015 was about to run from July 9-12. Like E3, the convention showcases what's new in the gaming world, with sneak previews of upcoming games and DLC. There'll be a *Call of Duty: Black Ops III* panel, which will premiere the new Zombie mode for the game, which isn't due to hit store shelves until November.



You can pre-order 1TB Ultimate Player Edition the Sony PlayStation 4 at most retailers.

+

"REGARDLESS OF WHICH PARTICULAR CONSOLE IS YOUR GAMING PLATFORM OF CHOICE, THEY ALL HAVE ONE THING IN COMMON: THEY'RE MORE EXPENSIVE THAN THE PC VERSIONS."

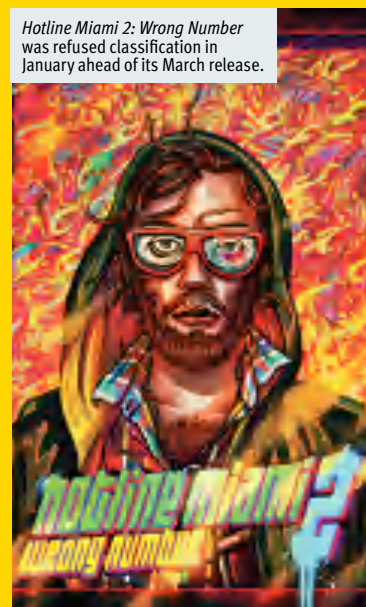


The latest version of Microsoft's Xbox One console is available with a 1TB hard drive.



Released in 2012, the family-friendly Nintendo Wii U offers a huge range of fun platform games.

Hotline Miami 2: Wrong Number was refused classification in January ahead of its March release.



second-hand titles are a great idea for console owners. We highly recommend reputable retailers EB Games (www.ebgames.com.au), The Gamesmen (www.gamesmen.com.au) and Gametraders (www.gametraders.com.au).

And don't forget the major electronics retailers like JB Hi-Fi (www.jbhifi.com.au), Dick Smith (www.dicksmith.com.au), Harvey Norman (www.harveynorman.com.au) and Target (www.target.com.au) when you're shopping around. These stores often have storewide sales that also apply to online purchases; for example, JB Hi-Fi often has a percentage discount off all games, or big savings when you buy two or more games.

Other great local online game retailers include Gamehead (www.gamehead.com.au), Ozgameshop (www.ozgameshop.com), Mighty Ape (www.mightyape.com.au), WOW HD (www.wowhd.com.au) and Games 101 (www.games101.com.au).

As for international sites, we love Amazon (www.amazon.com) and Zavvi (www.zavvi.com), although Compare Games lists many others. For console games in particular, overseas stores offer more than just cheaper games. For instance, *Batman: Arkham Night* is available from local retailers, but the version currently available at Zavvi still includes the Harley Quinn DLC, which may no longer be available if you buy the game in a store.

Since the Sony PS4 and Microsoft Xbox One

are both region-free, you can safely buy from any site you like. On the other hand, since the Wii U is region locked, Nintendo users need to be careful that purchased games are in the EU (PAL) region; however, rumours suggest Nintendo's yet-to-be-released NX console may do away with region restrictions. Again, if you're using the Compare Games site, the region is also listed within search results.

DLC

Additional content for released video games is known as downloadable content (DLC). DLC can include everything from additional maps and weapons to a whole new storyline, similar to an expansion pack. This means DLC can add new game modes, objects, levels, challenges and other features to an existing game, giving it even more replay value.

For Xbox One owners, DLC can be downloaded through the Xbox Live service; for PS4, DLC can be accessed via the PlayStation Store. For Wii U users, DLC is available through the Nintendo eShop, although the Wii Shop Channel (the predecessor to the eShop) is still accessible through Wii Mode, which allows you to download a host of legacy WiiWare titles and Wii-based Virtual Console games. ■



GAME CENSORSHIP

A major incentive to head online to buy games is a lack of local availability; in some cases, because certain titles have been banned. In the last four months, a staggering 220 video games have been refused classification (RC) by Australia's Classification Board — you can browse the list at tinyurl.com/o7yqcea — despite the existence of the R18+ rating for games. Worse still, there are a number of examples of games that have been edited for the Australian market in the hopes they'll be given a rating. Visit tinyurl.com/pvoxqup and you may be surprised at some of the familiar titles that have had content removed to satisfy Australian ratings standards — everything from *Fallout 3* to *South Park: The Stick of Truth*, to the *Grand Theft Auto* series and *Mortal Kombat*. Of course, some games remain banned outright.

DISCOVER

ESSENTIAL APPS, TOOLS AND ENTERTAINMENT

[HELLO WORLD]

Apps to broadcast yourself

WANT TO LAUNCH YOURSELF INTO THE ONLINE WORLD? PRESENT YOURSELF IN NEW AND INTRIGUING WAYS USING THESE SOCIAL APPS.

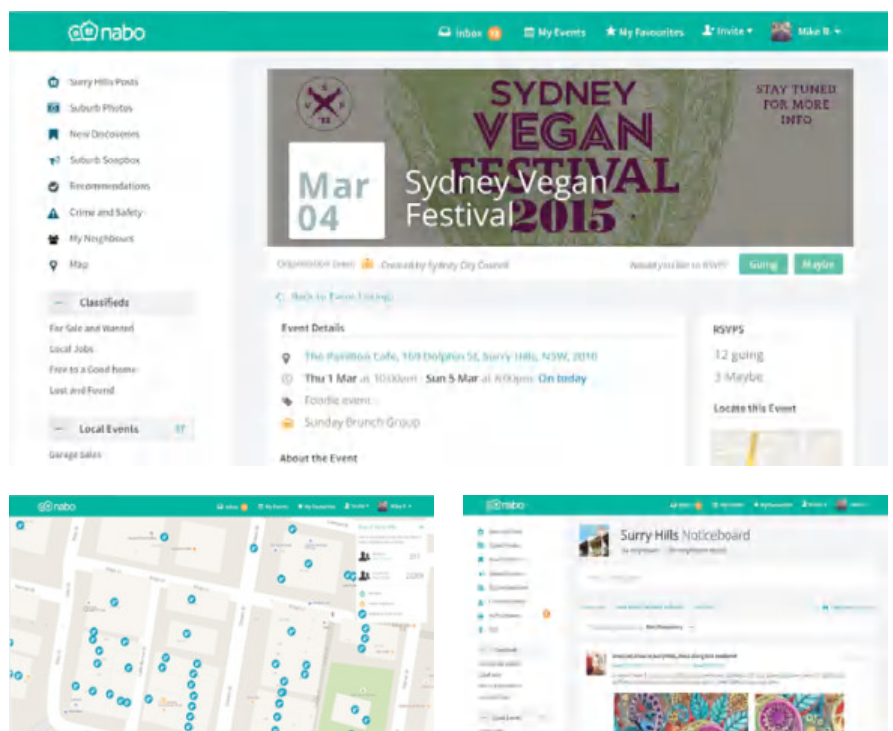
[TIM BOTHWELL]

WHETHER IT'S SHARING, connecting or broadcasting yourself, social networks have long allowed you to meet and interact with friends, family and the wider community via the internet. And yet, looking at some of the major platforms like Facebook, Twitter and Instagram reveals a common practice of liking, commenting and sharing. This similarity has caused many to look to alternative platforms that offer increasing levels of interactivity — so you can broadcast yourself in new and intriguing ways. In this feature, we've investigated at a number of apps and platforms that offer unique ways of presenting yourself to others — whether that's through live streaming video, podcast creation or online writing platforms, these tools will help you to further introduce yourself to the online world.



[WEB, IOS, ANDROID]
Nabo
 Free | www.nabo.com.au

While there's often an expectation for social networks to help in the expansion of one's social horizons, Nabo does the complete opposite, limiting your connections to provide a safe and secure place for your neighbourhood to interact. Promoted as Australia's largest 'local' social network, the app uses your geographic location to let you interact with those living nearby. Following verification, Nabo helps to keep users informed about happenings within the community — whether it's a garage sale, local mothers group or upcoming street party. You can even ask for advice from others — such as recommendations for a nearby plumber, or ask for help in the search for a lost pet. Also handy is the ability to receive push notifications for emergency alerts from the police or local council.





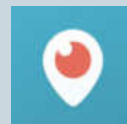
[IOS]
DUBBLE
Free
dubble.me

Competing with the likes of Instagram, Flickr and even Facebook, this photo-sharing service stands out by combining your photos with complete strangers in order to create unique and interesting double exposures. The process is dead simple — you take and upload a picture, with the image then automatically ‘dubbed’ with someone else’s — resulting in a cool, enigmatic looking photo. If you’re unhappy with the final picture, you can simply choose to ‘redubble’ it with another image, with the result able to be shared via Instagram, Facebook or email. Also included is the ability to browse, like and comment on dubbles created by others within the community.



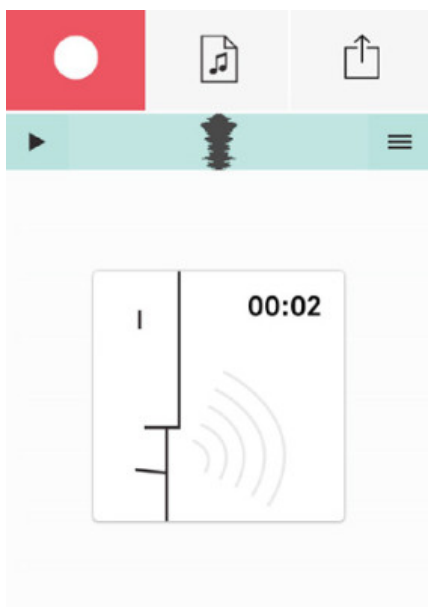
[IOS, ANDROID]
MEERKAT
Free
meerkatapp.co

Meerkat has had a massive impact on live-streaming video from your mobile device. To begin, you simply decide whether you want to start broadcasting now or schedule it for later, with other users being notified to tune in either through the mobile app or from a web browser. During the stream, viewers can interact directly with you as well as retweet the broadcast to their own Twitter followers. While you can choose to save a video of your completed stream to your mobile device, the platform currently doesn’t allow them to be re-watched by viewers (unlike competitor Periscope). One cool feature is the inclusion of a list of the most popular streams occurring at any one time, meaning you’ll be sure to find something that will interest you.



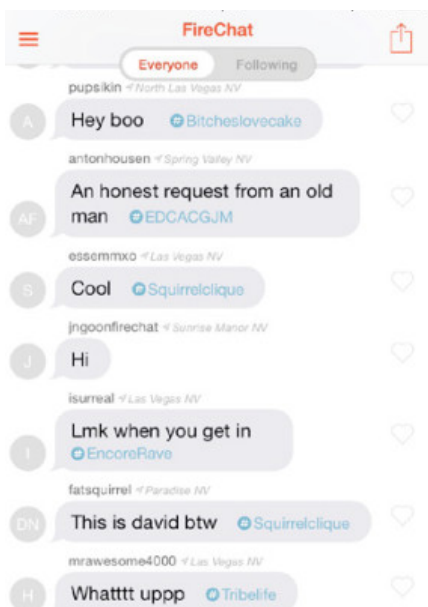
[IOS, ANDROID]
PERISCOPE
Free
www.periscope.tv

The other big player in the live streaming market, Periscope was recently released following an acquisition by Twitter for a reported \$100 million. Similar to Meerkat, the app broadcasts live streaming video from a mobile device to Twitter followers. Viewers can tune in via the app or from a web browser and are able to interact with the stream through real time comments or ‘hearts’. One advantage this app has over its competitors is the ability for broadcasts to be rewatched for up to 24 hours post-stream, with the app also allowing you to conduct ‘private’ broadcasts with select users — something apps such as Meerkat currently don’t allow. A list of streams can be viewed on an interactive map, showing the top locations where broadcasts are taking place.



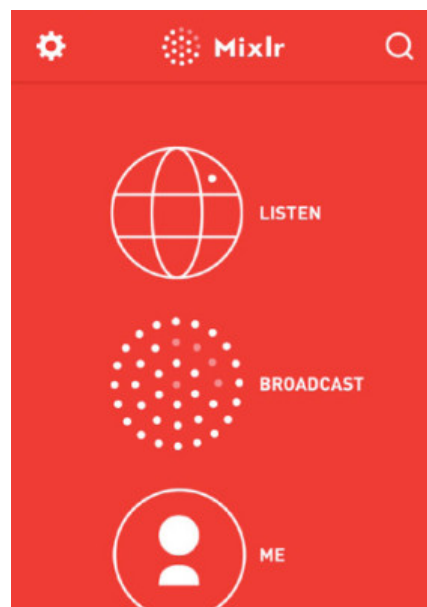
[IOS]
Opinion
Free with IAP
www.opinionpodcasting.com

Podcasts have experienced somewhat of a revival, so why not dip your toe into the broadcasting waters with this editing app. It provides a simple set of tools to help record and edit your very own podcast — recording interviews, narration, even live music (audio can be imported from your music library). A trimming tool fine-tunes your recordings, while a simple drag-and-drop interface lets you quickly rearrange sound files. Podcasts can be saved and exported to services like Dropbox or Soundcloud, with the app even offering a homepage and RSS feed for your show. While free to use, an in-app purchase is required for recordings longer than 10 minutes.



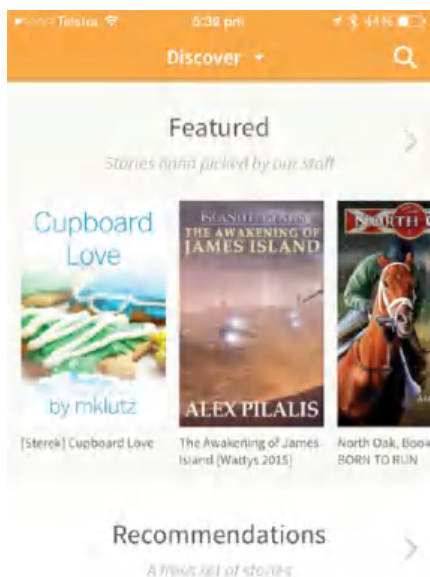
[IOS, ANDROID]
Firechat
Free
firech.at

While appearing similar to the plethora of other ‘chat rooms’ available on the app store, Firechat’s wow-factor comes from its ability to let you participate in discussions without the need for an internet connection. Using what’s called ‘mesh networking’ (similar to Apple’s AirDrop), the app uses Bluetooth in order to connect with those nearby, so you can chat ‘off-the-grid’. Its success has been seen during civil protests and events where mobile phone coverage might be poor or congested. When you do decide to come back online, the app allows you to join conversations on different topics or ‘hashtags’, while a live feed provides a place for general discussion.



[DESKTOP, IOS, ANDROID]
Mixlr
Free
mixlr.com

If live streaming yourself via video doesn’t sound appealing, then how about simply audio? Described as the ‘SoundCloud’ of live music, Mixlr quickly and easily broadcasts your voice to thousands of internet users worldwide. Featuring broadcasts ranging from musicians, DJs and comedians, you’ll be sure to find something that appeals to you. Once you do go live, listeners can be notified to listen in — and are even able to interact during the live stream between you and other listeners. Live broadcasts can be embedded on blogs, web sites and Facebook or Twitter, while shows can be saved and exported once completed.



[WEB, IOS, ANDROID]
Wattpad
 Free
www.wattpad.com

Stories are often seen as a way to escape the boundaries of everyday life, so what better resource than one featuring millions of books — all for free. With more than 20 million stories — ranging from sci-fi, fantasy, romance and thriller — you'll be sure to find a good book for any occasion, with thousands more being added daily. Using the mobile app lets you sync your library across devices, while a text editor allows you to write and publish your own stories anywhere, anytime. An offline mode is included, so you can read books without needing an internet connection. Probably the coolest feature are the social functions, where you can interact not only with other readers, but authors as well.



[IOS, ANDROID]
HaikuJam
 Free
www.haikujam.com

Poetry isn't traditionally a collaborative activity, but here the creative process is shared amongst a community. While following the structure of a haiku, it's clear that this isn't so much a poetry app as it is a form of 'visual haiku'. Using a combination of words and photos, users can create short stories, or 'poetic expressions' based on a certain topic or theme, with completed poems then able to be saved to Facebook, Twitter or emailed to friends and family. The app features a live feed of finished haikus that you can browse, like and comment on your favourites. Overall a fun form of creating poetry will friends, family and even the occasional stranger...



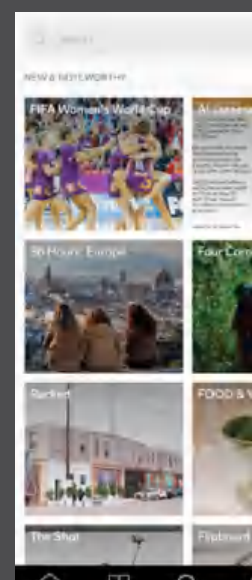
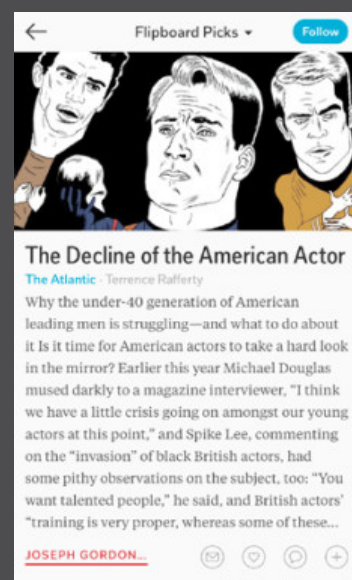
[WEB, IOS, ANDROID]
Medium
 Free
medium.com

As the distinction between bloggers and authors becomes increasingly blurred online, Medium attempts to give the best of both worlds by offering a unique reading experience. It's a self-publishing platform that anyone can use to publish their own stories, while also browse a diverse collection of articles ranging from personal accounts, opinion, and fiction — with thousands more being added daily. The mobile app offers a personalised reading experience, asking you to select from a number of interests to tailor content for you. It also lists articles that your friends are reading, writing and recommending. If you can't decide what to read next, there's a list of the top stories for that day.



[WEB, IOS, ANDROID, WINDOWS]
FLIPBOARD
 Free
flipboard.com

Although the internet's home to an endless stream of material, it seems increasingly difficult to find good quality content. Flipboard attempts to solve this by providing articles, photos and videos best suiting your interests — all presented in a personalised 'magazine'. Within the app you can choose from a wide range of interests — such as fashion, technology, sport, food, even politics — with the app then curating a collection of stories that will most appeal to you. As you browse through, each article can be saved to your very own magazine that can then be shared with others, while a recent update means you can also now add your own original content. Ever wanted to be a magazine editor? Now's your chance! ■



Google Photos will obviously back up your snaps, but it can also stitch together videos and add a soundtrack.



[KILLER APP]

Google Photos

THE BEST PHOTO BACKUP APP, WITH UNLIMITED STORAGE FOR IMAGES AND VIDEOS.

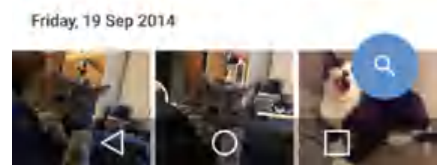
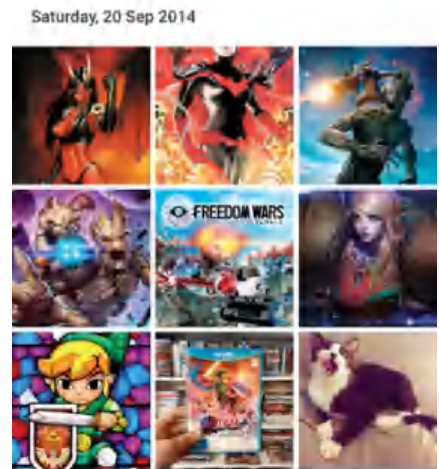
[STEPHEN LAMBRECHTS]



YOU'VE GOT TO hand it to Google — the company has done a fantastic job of providing people with useful and completely free alternative services to Microsoft Office's suite of products, with its Google Docs, Google Sheets and Google Slides apps offering pretty much all of the functionality found in Microsoft Word, Excel and Powerpoint. Now, it's Google to the rescue once again, as the company jumps into the image storage scene with another impressive (and free) cloud-based service that gives users unlimited backup storage for their entire photo collection (so long as they don't mind reducing the quality of their images a little). If you don't like the sound of your images being compressed, you don't have to worry — Google Photos also offers 15GB of full resolution image storage, though that space is shared with your other Google services and your photos have to be 16 megapixels or less. We realise that this sounds quite a lot smaller than 'unlimited', but it's actually three times the amount of storage that Apple offers on its iCloud service, so it'll probably be more than enough for the average person. Best of all, it'll also organise your library by date and theme, saving you a mountain of time in the process. Auto-tagging is also one of its most trumpeted features, though the accuracy of its tags has been found to be decent at best, and downright offensive at worst. When tagged properly, the app lets you run searches

on certain keywords, for example, typing 'dog' will filter your image collection to exclusively show you photos that have been tagged as such. Handily, you can also filter your collection by entering information about specific locations where photos were taken. Sure, it's not perfect yet, but Google is constantly working on ironing out all of the service's kinks, so the experience will improve over time. Another slick feature sees your related videos (i.e. ones that were created on the same day or at the same place) collated into a nifty singular movie with an accompanying soundtrack. Google Photos also works across all of your devices (including your desktop computer), uploading your pictures from each one so you'll always have your memories on hand. Admittedly, Google Photos' backup process can take a fair while, so it's a good idea to start it up and put it aside while it does its thing. Its apps for Android and iOS are also intuitive and nicely designed, with pinch-to-zoom functionality letting you resize your galleries (keep zooming out, and you will get a view of your gallery by month and year), and the ability to touch and drag across photos to select multiple images at once, which makes sorting and deleting big groups of images much less time-consuming. Another feature is an in-app 'Assistant', which can automatically suggest and create movies and collages out of your photo collection. It will also help to free up storage by scrapping redundant snapshots. A few quirks aside, Google Photos is a great option if you never want to worry about losing your precious pictures again. ■

Now you'll definitely never lose any of your precious cat pics...



[LATEST APPS]

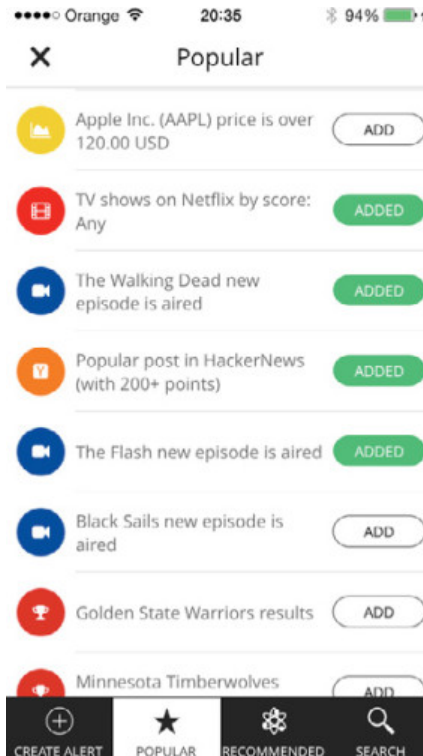
Magnificent new multiplatform apps

THE **TECHLIFE** TEAM UNCOVERS THE BEST NEW APPS THAT RUN ON MORE THAN ONE PLATFORM.



[ANDROID, IOS]
Crossroad
SHARE A COMMON PHOTO ALBUM
WITH FRIENDS
Free | crossroad.io

We all enjoy a good group gathering. Friends and family, getting together to share stories, laughs and drinks — but what about photos? Chances are that you'll spend a large portion of your time together posing for photos from various cameras, only to lose track of all the pictures taken. Some you might not even end up seeing at all. This is where Crossroad comes in handy. Crossroad lets you and your friends share your photos directly to a communal photo album, so that everyone instantly has access to every photo taken. This kind of thing is especially useful for big events, like music festivals, where everyone splits up amongst thousands of people to see different acts — with Crossroad, you'll all be able to follow the day on a Facebook-style photo timeline. Simply get your friends to download Crossroad, and then invite them (via email or text message) to join your album. Crossroad is currently in beta, and is available for iOS and Android devices. [SL]



[ANDROID, IOS]
Hooks
WE'D LIKE TO ALERT YOU TO THIS
GREAT ALERT APP.
Free | www.gethooksapp.com

Notifications have become very important in the smartphone age, with our handsets alerting us to many things throughout the day. For the most part, these alerts are inconsequential (yes, thank you for letting me know that I haven't played some garbage 'freemium' game in a while, Mr. Phone), but what if there was a way to receive alerts for things that actually matter to you? That is the basis for Hooks, the app that gives you access to a hundred channels that let you tailor your 'alert' experience to suit your lifestyle. Want your phone to alert you about the latest episode aired of your favourite show? How about the latest NBA results? Each channel in Hooks has hundreds of sub-options available, collated from all over the web, allowing you to make sure you never miss anything ever again. Top it off with a minimalist and user-friendly design, and your only trouble with Hooks will be deciding how many alerts to add before it becomes excessive. [SL]



[ANDROID, IOS]
Medium
TWITTER'S MAGAZINE
EQUIVALENT.
Free | medium.com

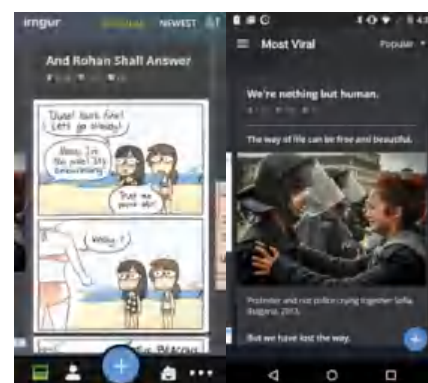
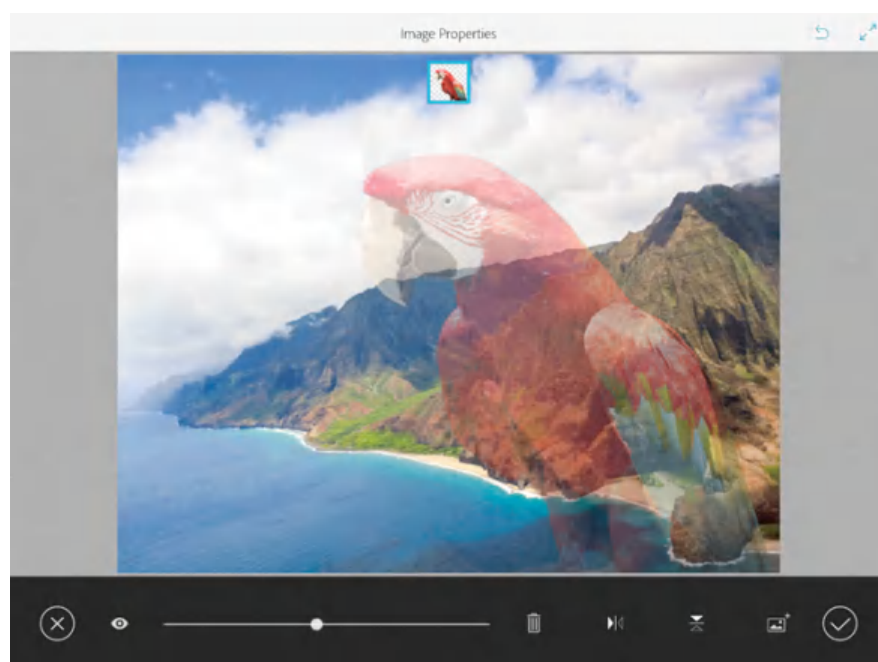
This popular blog-publishing platform, birthed by some of the people behind Twitter, has been floating about the web and the iOS ecosystem for some time, but the social journalism platform recently opened its doors to Android users. Apart from the fact that on the Android version you no longer have the option to sign up using just your email — which is both understandable and frustrating — the interface is, for the most part, identical to what iOS users will be used to. There's a vertically scrolling list of the most popular posts, curated newer entries and a section for your bookmarked stories. Other than that, this bare bones app only has a place to post new articles. You can continue to use the same account across different platforms, so if you're swapping between devices you won't lose all those bookmarked stories. If Twitter was a newspaper, Medium would be a magazine and if you enjoy longer form editorial stories, then this might be the online medium you're after. [JB]



[IOS, ANDROID]
Photoshop Mix
 ADOBE IS MIXING THINGS UP A BIT ON
 IOS AND ANDROID TABLETS.
 Free | tinyurl.com/nt7ruhs

Adobe's latest app for tablets is a slickly-designed, touch-based tool for compositing simple double layer images in a way that's very reminiscent of what the full version of Photoshop offers. Admittedly short on features, Photoshop Mix is nevertheless a responsive and attractive package that could do with some fine tuning. Dropping in and out of its various tools can feel a little confusing, and we'd appreciate some additional refinement functionality, but for the most part, Photoshop Mix does a decent job of guiding you through its various areas.

Integration of Creative Cloud tools that allow you to save your compositions as Photoshop PSD files on your Camera Roll, so you can pull them back and keep on working on them. You can also apply various Looks and Enhancements to your images, though don't expect Photoshop Mix to be a retouching tool — for that, we recommend that you hang on to the previously released Photoshop Touch app. Free and straightforward, Photoshop Mix makes for a fine addition to your stable of Adobe apps. [SL]



[IOS, ANDROID]
IMGUR
 'AWSM IMG AP'
 Free | imgur.com/apps

If you've watched a funny GIF in the past few years, chances are it was hosted on the insanely-popular online social image hosting service Imgur. And though there have been numerous third-party Imgur viewers to various smartphone platforms, the company recently decided to launch its own official Imgur app. Adding over 1.5 million images each day (and boasting 5 billion monthly page views), the new Imgur app is streamlined to let you skim through your favourite topics and vote on them easily. The apps intuitive left and right swipe will flick you through the latest buzz images and scrolling up or down toggles you between two viewing settings that have appropriate menu options. The top menu allows you to scroll between images quickly, easily tweak your topic or settings and swipe up to put the selected post into a full screen viewing mode, where you can also flick between posts and vote or share specific images. Though you might not be able to move through the same volume of posts as you can using the web interface, in terms of viewing experience the mobile apps may actually be better... [JB]



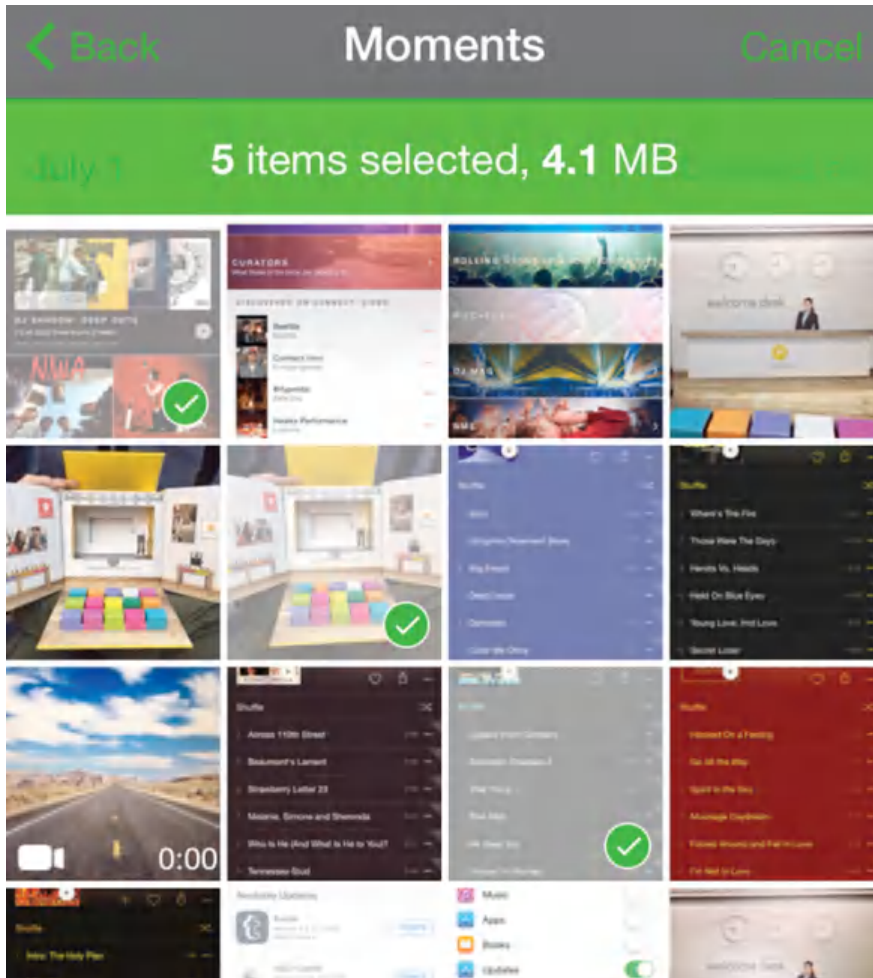
[ANDROID, IOS, WINDOWS
 PHONE]
CAMSCANNER
 THE NAME CAMSCANNER MUST HAVE BEEN
 TAKEN.
 Free | camscanner.com

Both Evernote and Microsoft have launched apps this year that can use a smartphone camera to turn printed notes into PDF documents. So this app space already has a bit of competition, but CamScanner does a good job at standing up for itself despite those high-profile competitors. Both Scannable and Office Lens are highly automated — which for most users makes scanning adorably simple — but if you're keen to get a little more hands on with your scans then you might actually prefer this more feature-rich offering. After taking an image, CamScanner has a toggle selection tool that includes a blown-up cut out with a cross hair — making it significantly easier to be precise about what your scan includes. The app also gives you a range of lighting, colour and rendering options that can tweak the raw scan, and once the image is imported there's a decent range of note taking, tagging and highlighting options too. The base app costs nothing, but you get a free 600MB of cloud storage if you create a free login — which is generous, considering the app already lets you export PDFs to a range of other applications. [JB]

[LATEST APPS]

Impressive new apps for iOS

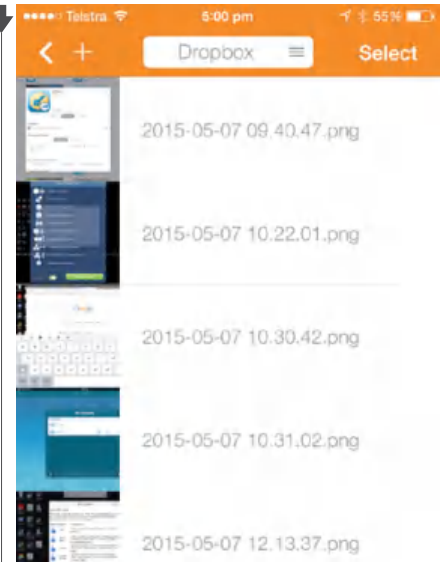
THE LATEST MUST-HAVE APPS FOR YOUR IPHONE AND IPAD!



[IOS]
BitTorrent Shoot
SEND AND RECEIVE LARGE BATCHES OF PICTURES AND VIDEO.
Free | tinyurl.com/nuy4luk

Eager to get away from its reputation as a piracy tool, BitTorrent has gotten into the habit of releasing apps that show a number of positive uses for its P2P protocol. First its storage solution BitTorrent Sync, then its completely private messenger app BitTorrent Bleep, and now comes BitTorrent Shoot, an app that uses P2P technology to send and receive large photo and video batches to your friends super fast. Simply enter Select mode to start picking the files you want to send, then hit Send Selected to

produce a QR code. Your friend (who also has to have the BitTorrent Shoot app) can then scan the code, transferring the files directly onto their Camera Roll. The app lets you receive an unlimited amount of transfers for free, though an in-app purchase of \$1.99 if you want to send your friends stuff after your third batch. BitTorrent Shoot is a fast and simple to use app that makes sending multiple files to another device an absolute breeze.
[STEPHEN LAMBRECHTS]



[IOS]
YOVIVO!
ALL YOUR CLOUDS IN THE ONE PLACE
Free | yovivo.co

With so many cloud storage solutions available, it's highly likely that you have your documents, images and videos spread out all over the place, making it very difficult to track down a specific file. Wouldn't it be wonderful to have access to all of your clouds in the one place? That's exactly what YoVivo! does. Once you've given YoVivo! access to your Camera Roll, social networks (including Facebook, Twitter, Flickr, Tumblr, Instagram and more) and cloud storage accounts (Dropbox, GoogleDrive, OneDrive and more are supported), your files will be accessible from within the app, so you won't have to go on a scavenger hunt every time you need to find something. Its user-friendly interface lists all of your services together for easy browsing. There's even an easy-to-use slideshow creator that lets you drop in images, videos, music and text from any of the files you've linked to the app, with further editing options like filters and emoji livening things up further. YoVivo! is useful and fun.

[STEPHEN LAMBRECHTS]

[IOS]
MENTO CAM
ALL YOUR CLOUDS IN THE ONE PLACE
Free | tinyurl.com/obpm285

There are a countless number of photo apps to choose from on the App store, the majority of which let you do the same basic things (add filters, make collages, add text, etc), but how many of them give you a convenient way to capture your own reaction as well? Introducing Mento Cam, an app that aims to take advantage of both your front and rear cameras. One half of your screen is devoted to the object you're taking a snapshot of, and the other half automatically flips the camera on to your face. You can also flip your screens around in any configuration you want. Mento Cam isn't just about photos, though — you can also set it to record video. And, if you're not in the habit of taking selfies, you can use emoji to get across how you really feel about what you've just seen. Until the iPhone can allow both cameras to be used at the same time, Mento Cam will do just fine.
[STEPHEN LAMBRECHTS]



Find the tech for **your world**

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TECHNOLOGY, TESTED



[LATEST APPS]

Adept new apps for Android

WE DIG UP THE HOTTEST NEW APPS FOR ANDROID PHONES AND TABLETS.

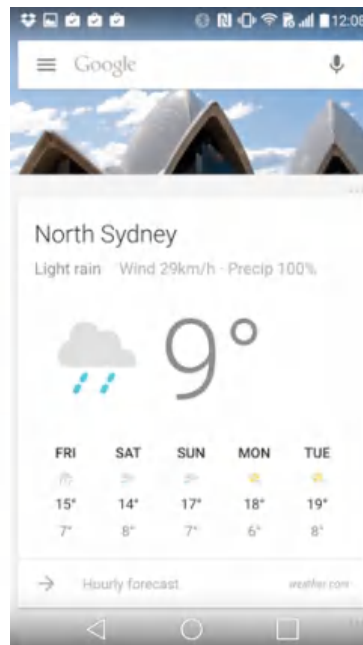


[ANDROID]
Google Now Launcher
MAKE YOUR PHONE PURE ANDROID
Free | tinyurl.com/q75c244

Outside of Google's own Nexus line of smartphones, most phone manufacturers place their own software 'skins' over each Android handset they release, effectively changing the OS experience (most notably the launcher) for the worse. Thankfully, Google Now Launcher is here to purify your Android phone. Possibly the most exciting app that Google has released in a while, Google Now Launcher brings a Nexus-style purity to your phone, providing it with a stock Android launcher. You can now enjoy an experience that's previously only been available on the Nexus 5, so long as your device

is running Android 4.x or above. The Google Now Launcher also makes Google's personal assistant a core part of your phone. It's a Google service that offers personalised information 'cards' that you can reach by swiping left on your homescreen, in order to choose what you want to receive notifications about. It also provides always-on voice capability, which you can reach saying "OK Google," and then asking it a question.

[STEPHEN LAMBRECHTS]



[ANDROID]
INPUTTING+
SMART TOOLS FOR WORKING WITH TEXT
Free | tinyurl.com/ou4ac7a

Ever wanted to have undo, redo, clipboard or 'find and replace' functionality for text when using your smartphone? That's exactly what Inputting+ provides. Once enabled, Inputting+ places a bubble on your screen whenever text input is available (don't worry, you can make the bubble small and transparent) that lets you undo what you've just written with a single tap, and redo it with a second. Unlocking the 'Pro' version of Inputting+ (for a \$0.99 fee) will provide you with a timeline of collected text inputs from every app, so you won't lose anything you've written due to a crash or poor reception. If you've ever had that happen to you, enabling Inputting+ should be a no brainer. While you do have to give the app access to monitor your text inputs, it doesn't have web permissions, so your texts won't be collected and read by anyone online. If you're cool with this, you'll find Inputting+ to be a very useful addition to your Android arsenal.

[STEPHEN LAMBRECHTS]



[ANDROID]
MICROSOFT OFFICE
OFFICE OFFICIALLY REACHES ANDROID SMARTPHONES... FINALLY.
Free with Microsoft account | tinyurl.com/TLA41-Office

For many workers, Microsoft's Word, Excel and Powerpoint apps have been the cornerstone of modern productivity for over two decades, but until June of this year, Microsoft had held off releasing its official Office products for Android users. Fortunately, that's no longer the case and, on the proviso you're willing to set up a free Microsoft account, you can now use your Android phone or tablet to edit and view documents to your heart's content. That Microsoft account really is the key to the kingdom here, because if you don't have one — or you'd prefer not to set one up — then you'll only be able to read Office files. Once you're in though, the Office apps are clean and well designed, allowing you to do all the basics you'd expect (and more than most users probably need). That includes opening and saving documents through your OneDrive account, or even syncing the apps with Google Drive and Dropbox. As far as Android productivity apps go, Office is pretty great, but considering how well-established apps like Google Drive already are on this platform, it might not be enough to convert the masses. [JOEL BURGESS]

[LATEST APPS]

Wicked new apps for Windows Phone

GET THE BEST NEW APPS FOR YOUR MICROSOFT-DRIVEN SMARTPHONE.



[WINDOWS PHONE]

InstaNote

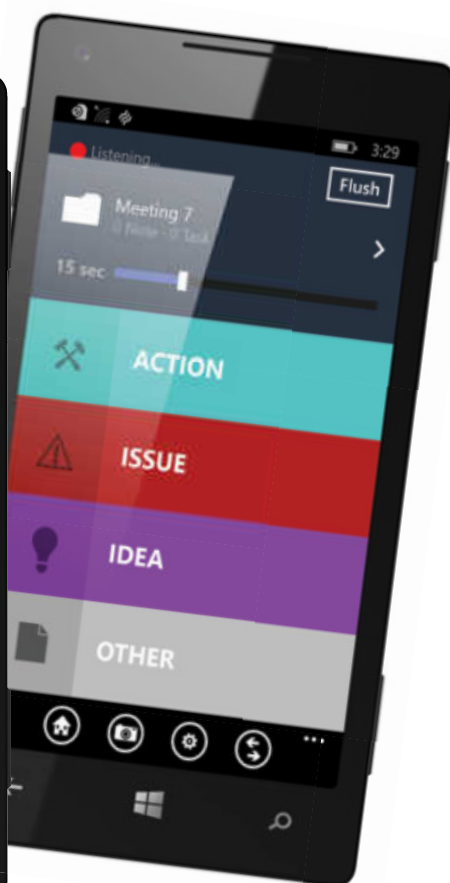
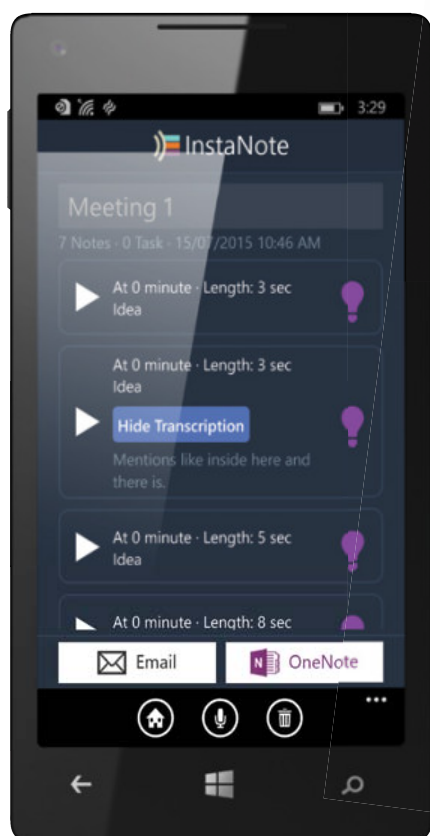
A TOTALLY NEW TYPE OF NOTE TAKING.
Free | tinyurl.com/TLA41-InstaN

One thing about having an operating system created by Microsoft is that there never seems to be a shortage of note-taking apps. Despite the plethora of options already available to Windows Phone owners, chances are you'll likely still want to take a look at this new offering from Microsoft's edgy DIY innovation center: Microsoft Garage. Yes on top of note taking, InstaNote also has an audio-recording feature, but this app's audio capture method is a little different to most. Instead of the usual start-and-stop recording, this app has a button that will capture the last 30 seconds of audio and run it through Bing, where all that audio will be transcribed into a succinct set of notes. The idea of having the most important chunks of a lecture, meeting or interview transcribed for you sounds like a dream come true, but

“ONE THING ABOUT HAVING AN OPERATING SYSTEM CREATED BY MICROSOFT IS THAT THERE NEVER SEEMS TO BE A SHORTAGE OF NOTE-TAKING APPS.”

admittedly, InstaNote is a little tricky to use at first and it doesn't always flawlessly transcribe notes. That said, in the worst case scenario, you still have all the audio snippets of the most important info.

[JOEL BURGESS]



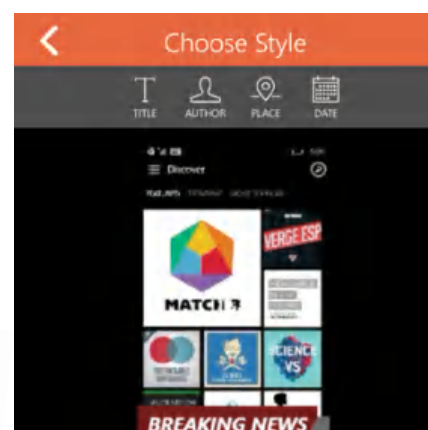
[WINDOWS PHONE]

VIDEOSHOP

A COMPREHENSIVE DRAG AND DROP VIDEO EDITOR.
Free | videoshop.net

With photo and video editing apps for smartphones, there's a delicate compromise struck between the number of editing features available and the simplicity of the app overall. Too much either way and you end up with something completely useless or, conversely, overly time consuming. In terms of features, Videoshop really pushes the envelope. The app includes enough ways to edit your imported or in-app videos to genuinely justify a \$2.49 price tag for the iOS version. What's better is that it's currently available on Windows Phone for free, and the devs have managed to make this full-featured version so intuitive that you can prod your way through a sophisticated level of video editing effects from the moment you start using it. Videoshop lets you overlay text, verbal narration and music, as well as trim clips and add transitions between them, resize and rotate footage, apply filters and manually tweak colours — you can even add banners that slide into frame like a news report. The fact that you can do all this with drag and drop elements and then save or upload straight to YouTube makes it an appealing app for anyone interested in video creation.

[JOEL BURGESS]



[WINDOWS PHONE]

WHATSAPP

THE MODERN MSN MESSENGER CAN NOW TALK.
US\$1 a year (first year free)
whatsapp.com

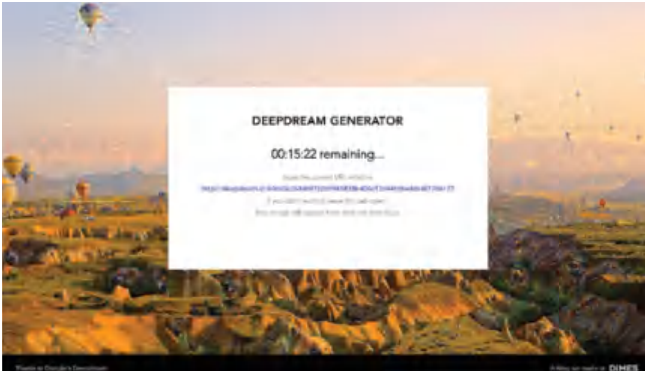
This popular instant messenger app was purchased by Facebook early last year for a tidy US\$16B and promised to start rolling out voice calling features soon after, across all compatible platforms. By March 2015, the company had ticked off voice calling compatibility for a broad list of Android devices, with iOS updates following soon after. And now Windows Phone users can finally enjoy the fruits of WhatsApp's web calling update too. Considering one of the best aspects of this web messenger is the group messaging function and that the call features only allow for one-on-one conversations, the new update also brings with it the added ability to send recorded audio messages to your group. WhatsApp already offered a raft of unique features that let you send custom automated responses ("Can't talk my phone is about to die", for example) or your GPS location on an interactive map, so even though it costs US\$1 per annum (after the first free year) the new audio features are a welcome icing on an already desirable app-cake.

[JOEL BURGESS]

[BEST APPS]

Unearthed

THE *TECHLIFE* TEAM'S FAVOURITE NEW SITES, SERVICES, BROWSER PLUGINS & OTHER HANDY TOOLS.



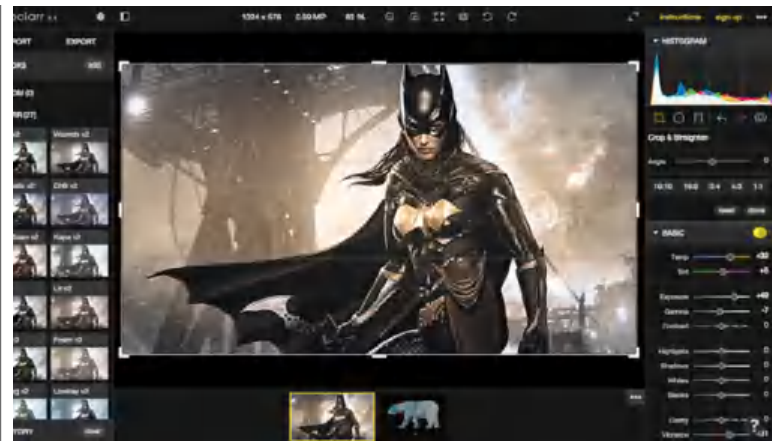
[WEB SITE]

Google Deep Dream

MAKE YOUR OWN 'NEURAL NETWORK ART'.
deepdream.in

There's plenty of art that's generated by humans using computers, but what about art that's generated *by* a computer? Some Google engineers working on imaging technologies have cobbled together a program that seeks to do just that, taking existing images and making them more fantastical and painterly. While the results can occasionally be quite beautiful (looking vaguely inspired by Vincent van Gogh's work) the Deep Dream program also has a general penchant for making things furry, covered in eyeballs, fishy-looking and with the occasional dog snout. You can have Deep Dream turn your own photos into art by uploading them to the above link. The image shown here was generated using a shot of Pizza Hut's Four'N Twenty Stuffed Crust pizza... which, admittedly, was probably nightmarish enough without any Deep Dream tampering. We're not sure if it's art, but it definitely doesn't look edible.

[DAN GARDINER]



[WEB APP]

Polarr

A FREE IN-BROWSER PHOTO EDITOR.
Free | v2.polarr.co

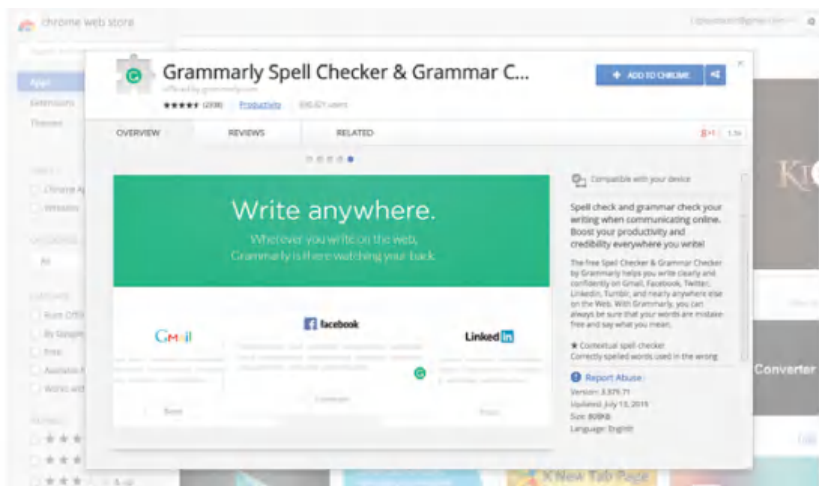
If you're like us, you often find yourself in need of sophisticated photo editing tools on a computer that isn't your own. An Adobe Photoshop license isn't always available, and many of the free photo editing tools that you can find online don't offer much functionality. Enter Polarr, an editing solution that gives you a fairly deep set of tools to tweak your images. With Polarr, you can adjust temperature, tint, contrast, clarity saturation and more. Cropping tools are also available in a number of different ratios, as well a histogram display of your image's numerous values, allowing you to tweak them at your leisure and see instant results. If you aren't interested in messing with a bunch of sliders, Polarr also has a range of Instagram-style filters available that drastically change the tone of your images. You can also import images from the cloud. OK, so it's still a far cry from Photoshop, but it gets the job done — for free, we might add. [STEPHEN LAMBRECHTS]

[BROWSER ADD-ON]

WaitChatter

APRENDER ESPAÑOL WHILE YOU WAIT.
Free | tinyurl.com/TLA41-WaitC

If you use Google Talk — or Google Hangouts — through your Gmail account and you also happen to be the type of person that hates/loves wasting your day waiting for messages to come in, it might be time to learn Spanish. We'll explain. Wait chatter is a new Chrome extension that will teach you Spanish in the interim between Google Talk messages. It's a little extension that sits under your chat box and gives you simple single-word translations that you have to type in to answer. This language teacher will show you four new words on rotation, using a simple system that alternates between asking you to type the English translation to progressively requiring you to type the original Spanish word. But despite this app's simple nature, it's actually surprisingly enjoyable, maybe even a little addictive. Because you have to type the word, spelling is really important and though the app description states that it can also do French, we couldn't find an obvious setting switch to change this. It's a little tricky to set up initially and it only works through the Gmail version of Google Talk (and not Hangouts), but other than that, nos gusta! [JOEL BURGESS]



[BROWSER ADD-ON]

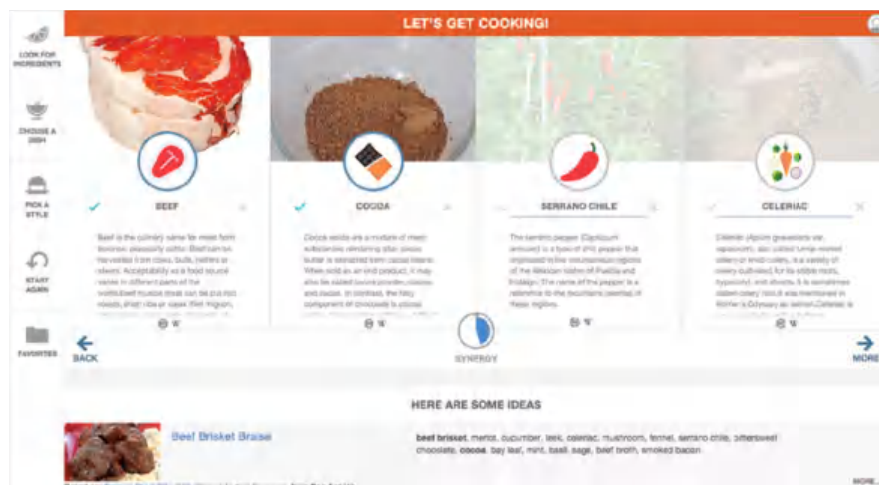
Grammarly

LISTEN UP, PEOPLE WITH TERRIBLE SPELLING AND GRAMMAR — YOUR IN 4 A REEL TREET.

Free | tinyurl.com/qbkebxf

Let's face it — around 90% of people on the internet could do with a Chrome extension like Grammarly. This handy tool aims to make you a better writer by finding and correcting up to 10 times as many mistakes as the average word processor would. Grammarly claims to be able to spot and fix over 250 types of errors (when upgraded to Grammarly Premium, for \$11.99

a month), many of which go completely under Microsoft Word's radar. It will also offer you context-optimised synonyms suggestions, so you won't have to keep using 'amazing' and 'awesome' over and over again. Better still, Grammarly will attempt to educate you on the mistakes you make, in an effort to prevent them from happening again in the future. Once installed, it'll fix the spelling and grammar of anything you type into your Chrome browser, including emails, social media posts and much more. With Grammarly, you can start writing like a grown-up, you hear me, YouTube commenters? [STEPHEN LAMBRECHTS]



[WEB SITE]

IBM Chef Watson

LEARN HOW TO COOK FOR HUMANS.

Free | www.ibmchefwatson.com

IBM's Watson software is billed as a cognitive AI, which means it's meant to be able to learn from absorbing real-world data. It was originally designed to compete on TV game-show Jeopardy!, where it did very well, whipping its human opponents and winning US\$1 million back in 2011. The Watson software hasn't lain dormant since then however, and it's been further developed to tackle other applications, including making treatment recommendations for healthcare. And now, it wants to help you cook by making recipe suggestions — ones that specifically seek to "discover unexpected flavour combinations

[you] might never have thought to put together". The results aren't entirely Watson's — US food mag *Bon Appétit* has helped fine-tune the suggestions and created full recipes, and some of the "unconventional pairings" have apparently been quite good. Using the web site, you can select the ingredients you want to combine and Chef Watson will recommend recipes (and further ingredients) to match — you can use beef, cocoa and chilli to make a hearty-sounding beef brisket, for example. Note that the site uses American Imperial measurements (ie. pounds and ounces), so you'll need to adjust accordingly. To our minds, it sounds like Watson just wants to use us as human guinea pigs, but we're still tentatively intrigued... [DAN GARDINER]

[WWW.TECHLIFE.NET]



[WEB TOOL]

JSCREEN FIX

THE ONLY PIXELS IT WON'T FIX IS THE ADAM SANDLER VERSION...

Free | jscreenfix.com

Problems with stuck screen pixels aren't all that common, but when they do occur they're likely to pre-empt an enormous man-tantrum — even from the most composed of us tech lovers. The thing is, a dead, stuck or hot pixel will often fall into the 'can not fix' category and these hardware problems are equally as likely to occur from the day you pull a new screen out of its bubble-wrapped womb. But before you jump on the phone and open a big ol' can of whoopass on your LCD manufacturer, it's worth checking if the problem can be fixed by this simple web app first. The devs at JADS have uploaded their JScreen Fix applet to a web site (jscreenfix.com), meaning you can quickly fix a stuck pixel without having to go through the process of downloading the dedicated application. The online java app has a little box that'll blast a portion of the screen with white noise, so all you have to do is place this box over the problem child and leave it be for a few minutes... after which, it'll hopefully be 'cured'.

[JOEL BURGESS]

[EMAIL TOOL]

EMAIL UNDO SEND FEATURE

SAVE YOURSELF FROM YOUR OWN STUPIDITY.
mail.google.com

Google's Gmail has a lot of smarts built in, and it's gotten gradually savvier over the years, adding features like the ability to warn you if you write 'attachment' in the body of your email but haven't actually attached a file. One handy add-on that's been available as a 'Gmail Labs' feature for several years already is 'Undo Send'; turning it on gives you a short time interval after you've sent an email in which to take it back. Google's apparently decided the feature's now ready for prime time (we don't know what took it so long), meaning you no longer have to hunt through the Labs back end to enable it: just click the Settings cog icon at the top-right of the Gmail web interface, click Settings from the drop-down list and then find the option under the General tab. You can give yourself up to 30 seconds to 'unsend' an email, though note that this doesn't actually mean you're recalling an email — Google's just adding a delay between when you click Send and when its servers actually send it out. [DAN GARDINER] ■

Our relationship with the Batmobile is of the love/hate variety.

DESIGNING GOTHAM

In *Batman: Arkham Knight*, you'll get to stalk the entirety of Gotham City for the first time in the Arkham series. We asked Dax Ginn, Game Marketing Director at Rocksteady, how the team approached the creation of this iconic place. "Laying out the city was something that we did in conjunction with the design of the Batmobile's capabilities," said Ginn. For the team at Rocksteady, this meant utilising the "the horsepower of the [next-gen] consoles," with Ginn explaining that several factors had to be taken onboard before setting out to create the city. "So how wide do the streets need to be? If you miss a corner and you hit the wall and you're going at 100 miles an hour do you just stop dead? Because that doesn't really feel like a very Batman experience, so we're like no, you clearly just have to just rip that corner off that building," Ginn said, with a Joker-sized grin on his face.

[GAMES]

Knight fight

THE TECHLIFE TEAM TESTS THE LATEST GAMES ON PC AND CONSOLES, INCLUDING THE CLOSING CHAPTER IN THE BATMAN: ARKHAM TRILOGY.

Batman: Arkham Knight

THE CAPED CRUSADER TAKES HIS FINAL BOW. FOR NOW.

\$99.95

PC, PS4, Xbox One
batmanarkhamknight.com

4

GOTHAM IS A city under siege. Its streets are awash with rain and blood, as glistening neon pavements provide the playground for drones, tanks, thugs and maniacal villains to run rampant. The good citizens of Gotham have been sent scurrying away, leaving behind the violence and chaos caused by a mysterious new figure known only as the Arkham Knight, and his accomplice, Scarecrow. Commissioner Gordon and the GCPD are hopelessly outmatched, and only one man has what it takes to end this siege once and for all – the Batman.

Picking up right after the events of *Batman: Arkham City*, in this fourth series entry (if you include last year's Origins prequel) our hero is a changed man. Having been infected by Joker blood, Batman is plagued by horrific visions of his past failures — and now it seems that one has come back to haunt him. Who is the man behind the Arkham Knight's mask, and why does he loathe Batman so much? These are the questions that drive the game's story forward, and while you don't need to be the world's greatest detective to solve that particular mystery long before answers are revealed, it's still a fairly compelling reason to soldier on. Admittedly, the Arkham Knight himself isn't particularly menacing or

interesting, speaking almost entirely in a whiny monotone. When placed alongside Batman's existing villains, he feels particularly bland.

Thankfully, it feels as awesome as ever to play as Batman. Using the Grapple Gun to launch yourself over rooftops and glide across the city is still immensely satisfying, and Batman's combat system has yet to be topped by another game.

One thing that should enhance your Batman experience is the much-anticipated addition of the Batmobile to the *Arkham* franchise, however this is only true half of the time. Gotham City's three times bigger than Arkham City, encompassing three distinct islands, so it makes sense to traverse it in a vehicle. And once you get the hang of the Batmobile's slippery handling and awkwardly-mapped controls, it feels great,

but any goodwill earned from performing a perfect curb-destroying powerslide is squandered by the dreadfully repetitive and seemingly never-ending tank combat sections. To put it bluntly, this element's a total misfire.

With that said, *Batman: Arkham Knight* is still a tremendous achievement, boasting an unrivalled level of polish and a cinematic story that's filled with callbacks to Batman's illustrious 76-year history. Surprise character appearances, a wealth of side missions and a brilliant and satisfying ending round out this near-masterpiece, held back only by its questionable lead villain and terrible tank combat. If this truly is developer Rocksteady's last Batman game, it's a hell of a way to let the character go.

[STEPHEN LAMBRECHTS]

A rogue Zangief approaches Batman from the rear.





Once you've played as a character, it's easier to spot and react to their moves, such as Stitches' thundering Slam.



Heroes of the Storm

BEEN HOLDING OUT FOR A MOBA HERO?

Free with IAP | PC, Mac
us.battle.net/heroes

The ultimate lure of Blizzard's long-awaited entry into the world of the multiplayer online battle arena can be felt only in the heady afterglow of a smart play. In many other genre entries it's very possible to wait the better part of a month before this moment comes. By tweaking and tailoring the form, slicing away at certain bits, and glueing more on to others, the *Warcraft* maker has somehow managed to enable those satisfying moments where it all seems to come together to occur more regularly and for more people. It sits comfortably in the middle ground, providing enough depth for the hardcore to feel challenged, and yet allowing the newcomer to thrive within its folds.

For the complete MOBA tenderfoot, *Heroes of the Storm* places you as a member of a five-strong team of characters from Blizzard's past. Working together, from a top-down perspective, you have to conquer a map, typically spreading out into lanes, across which squishy AI minion armies do battle. As a hero you pack an arsenal of four active abilities and a bevy of passive ones, which allow you to perform tide-turning feats. *Heroes* comes in four flavours, too. There's the hard-hitting tankier types, the Warriors, who help more delicate sorts survive for longer. There are the damage-dealing Assassins, perfect for finishing off opposing players. Support workers augment those they choose to double-up with, while Specialists can vary in roles, from efficient building demolishers to a divide and conquer trio of bearded pillagers. The aim is to push down lanes and suck up experience for the team

while downing foes, AI-controlled or otherwise, before demolishing a giant monolith at the heart of your enemy's base.

The presentation is immaculate here, and we're not just talking about the visuals. Blizzard manages to imbue your frantic clicks and quickfire keyboard taps with a sense of supreme power. Minions explode satisfyingly as you lay down the more impactful skills, while lining up and firing off a precision attack to land the final blow on a fleeing player is the stuff of multiplayer legend.

If you're not quite on top of your game, or need to get a bit more practice in when playing as a certain character, there are a pleasing array of PvP and AI enemy game types to move across, too. *Heroes* does a brilliant job of gating you off from certain player-on-player modes until you're ready for them, ensuring there's little excuse for newbie abuse.

Anyone even vaguely familiar with the genre at large will know how infamously prickly its communities can be. Part of the reason for this is that, in a traditional MOBA, there's simply too much to get angry about. *HOTS* handles this by making it very rare for a match to be rendered unwinnable early on. And even if things get hairy, right up until the end of a match it always seems possible that your team just might be able to wrangle a victory.

Viewed as a solid and approachable gateway MOBA then, *Heroes of the Storm* has no rival, even if its contemporaries are slightly ahead of the hardcore curve.

[MATTHEW SAKURAOKA-GILMAN]



The unique maps are great fun and fuel creative team play.

NOM NOM GALAXY

OM NOM NOM...

These days, tower defence games are a bit like Meryl Streep in a new film: sometimes you don't recognise them straight away. Nowhere is that truer than in PixelJunk's sprawling galactic adventure *Nom Nom Galaxy*. It embodies so many different genres the development process likely involved throwing darts at a board peppered with notes such as 'platformer', 'resource management', and 'soup'. As confusing as that is at first, once you get into the swing of it, *Nom Nom Galaxy* is oddly charming. Our hero is a little robot armed with an astro-buzzsaw as big as his face that he uses to mine a planet's resources in order to make galactic soup that's not your average Heinz variety. A pie chart in the top-right of the screen tells you the market share between your company and a competitor's. If you carve out too much profit, prepare for an invasion from your rivals — hence the tower defence. You'll be so busy collecting ingredients, maintaining the factory, setting up turrets and exploring the planet that you'll barely have time to notice the wondrous artwork — but wonder at it you must. *Nom Nom Galaxy* is deliciously stylised and gloriously diverse. Each brightly coloured planet is different from the last, keeping things feeling fresh when it could go stale. Sure, there are a lot of questions left largely unanswered. Where is this rocket-fired soup going? Is this mammoth to-do list really necessary? Do robots even eat soup? Still, for a game that ostensibly charts Heston Blumenthal's culinary creative process, *Nom Nom Galaxy* always manages to pull you back in for a spoonful more. Slurp it up.

[ALYSIA JUDGE]



From US\$9.99 | PC, PS4
nomnomgalaxy.com



It's brilliant fan service that captures your favourite dino moments.



LEGO JURASSIC WORLD

THE PARK IS OPEN...

Welcome to Jurass... uh, the first decent dino game in ages. Wondering if this has your favourite moments of Spielberg-sponsored, toothy magic on its tour? Fret not: *Lego Jurassic World* is an all-encompassing beast that recreates every major incident from all four films, across 20 charmingly constructed story levels. The T. rex paddock attack! Jeff Goldblum's ginger girlfriend shattering glass (and nerves) in that suspended trailer scene! A whole bunch of setpieces from *Jurassic Park III* no-one remembers! If it happened on the big screen, you can bet it's been reimagined in warm, witty fashion. The game very much follows developer TT's well-established structure. The company's playing it safe — well, as safe as can be when you've got a hybrid super-dino that can camouflage itself stomping around. That means gentle puzzling, the odd pinch of platforming, and a whole lot of collecting studs. And it's all brilliant fun. While *Dinosaur Handler A* or *JPIII*'s Mr Udesky are hardly going to rival Iron Man or Han Solo, the game's cheekily padded roster nails the important characters. Each one has a special ability that ties into solving environmental conundrums. Alan Grant gets a dino claw to slash away at long grass (pro tip: don't go into it). Ellie Sattler can grow plants to reach higher platforms. The real stars are, of course, those rather large lizards. There are over 20 playable species, spanning everything from The Lost World's tiny compsognathus to the new film's Indominus Rex. Some are unlocked by collecting hidden amber chunks, while others crop up in key story moments. Like the original film's epic ending, *Lego Jurassic World* lets you save the day with old REXY. Better yet, TT has gone and designed a battle arena where you can make your critters fight. As ever, there's a ton of content to keep both little ones and big kids entertained. The hub worlds of Isla Nublar and Sorna are brimming with gold bricks to collect, park workers to save, and dinos to heal. There are even little checkpoint races to bomb around in — damn if those Lego Ford Explorers aren't cute. The game also playfully taps into the building theme by letting you construct gloriously silly custom dinos down at the Hammond Creation Lab. Witchcraft! Sure, some story levels suffer due to the inferior source material of the sequels — playing through *JPIII* can be a real trudge. You could also claim TT recycling its tried and trusted template is a little lazy. Still, when you combine Lego Ian Malcolm, a pitch-perfect recreation of that kitchen scene, and the best menu music ever (thanks, John Williams), you're left with a seriously clever girl.

[DAVE MEIKLEHAM]

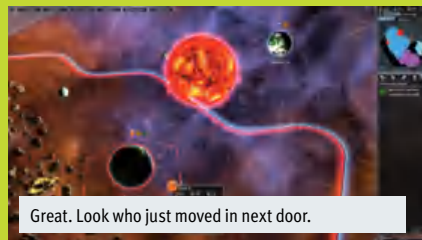
From \$49.95 | 3DS, PC, PS3, PS4, PS Vita, Wii U, X360, XO
www.lego.com

4

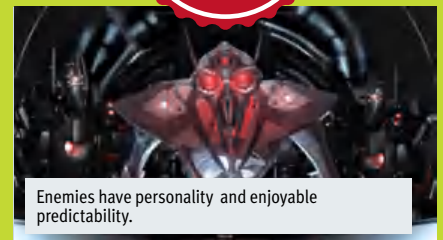
You can't control combat, but you can enjoy some highly cinematic views.



TECHLIFE
EDITOR'S
CHOICE
TECHLIFENET



Great. Look who just moved in next door.



Enemies have personality and enjoyable predictability.

Galactic Civilizations III

SPACE TO GROW.

US\$49.99 | PC
www.galciv3.com

4½

GalCiv 3 doesn't so much pick up where the last game left off as return to its template with a stern expression, better technology, and a few years of lessons well learned.

The series is almost unique in the 4X genre: a space conquest game that's not just a game of rules and strategy, but of quirky charm. Witty descriptions take the harsh edge off the technologies, there's an attempt to make the aliens feel like they have personalities instead of simply a rendered face over some stats, and there's enough wrapping to suggest there could actually be people somewhere behind your comma-filled population figures.

Aside from graphical polish, the two biggest differences between this version and the last are multiplayer and the demand for 64-bit. The latter means that future expansions and player mods have far more room to breathe than they once did, which bodes well.

The core game is extremely solid. Playing against the AI feels like being up against opponents rather than simply algorithms. Where so many 4X games are almost wilfully cold, there's a warmth to *GalCiv* that is key to the fun of casual to at least mid-tier play.

A few irritations strike midway through, such as the difficulty of finding out what's actually wrong with a planet that should be performing better than it is, and of otherwise tracking down numbers in a pinch. By the time you've got a sprawling empire, there's enough data splashing around to drown in. Individual sections are

very well laid out, with the tech tree especially making it easy to see what leads to what and what the benefits are, but you feel the lack of a good centralised in-game Civpedia.

The biggest omission from the last game — for now — is that the political side has been stripped down. No elections, no governments, no spying. They're due to return in a later expansion. The sting is taken out of that by a few new arrivals, such as ideologies. Where past games had a good/evil system, civilisations this time are judged as Malevolent, Pragmatic and Beneficial, with moral decisions providing points in each that can be cashed-in for special perks. These range from a free colony ship or a top-quality planet, to galaxy-affecting boosts.

You don't get any direct control over your ships, instead they're classed by their loadout. A basic hull might be a Guardian, but slap life-support on it and it becomes a Support. Its role determines what it does and who it goes after in combat.

Whether you're new to the series or returning, *GalCiv 3* is easily the best recent 4X of this scale — the whole galaxy as campaign and sandbox. It's hardly the most dramatic upgrade, but it's more than solid, and a great base for expansions and mods for the next few years.

[RICHARD COBBETT]



Chain lightning can fry scores of foes.



Sure, you could heal your mate while he fights off this horde of monsters. Or you could just stare into the distance.

Magicka 2

SPELL CHECKING THIS UTTERLY ELE-MENTAL ACTION-RPG.

US\$14.99 | PC
www.magicka2.com

‘Wizard’ might not be the right term for the staff-wielding Jawas of *Magicka 2*. There’s a name for magic users primarily concerned with returning people from the grave: necromancer. Not that the robed terrors have forgotten the eight elements of magic and the firework displays of inventive chaos to be had from combining up to five of them at once and unleashing the result. But when your spells harm both friend and foe alike, and your hardy enemies have no compunction about blighting the earth with their own powers, your biggest consideration is usually keeping someone, anyone, still alive to continue the fight.

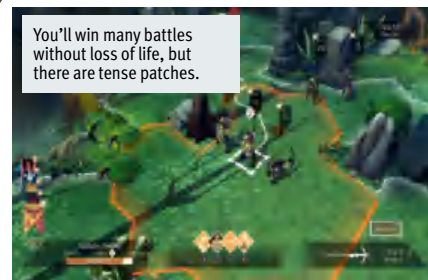
Which is to say that the spirit of *Magicka* is largely intact. Pieces Interactive may have picked up the series now that Arrowhead has moved on to *Helldivers*, but it hasn’t strayed too far from established ideas. That means a screwball script that nods to the likes of *Lego* and *The Matrix* as often as Tolkien and D&D, though most of the laughs come from the slapstick of riming companions with icy healing mines, or rebounding death rays that splatter a friend. It means a streamlined quest across a prettyish little wilderness full of things to hammer with freezing rocks, or fry with arcs of fiery electricity. And it means a game that’s best with friends, where you have the frisson of dodging friendly fire but the chaotic thrills of mashing spells together.

On your lonesome, it’s an exercise in

frustration. Pieces has greatly emphasised movement, allowing you to cast on the go, but that comes with mobs that tirelessly run you down and camp on your grave. Your familiar can grant a revive, but with a fair old cooldown on the spell to recharge it and lots to dodge with only a few unreliable Magicks to aid you, many battles devolve into running around as you try to avoid restarts. Poor checkpointing doesn’t help, often bouncing you back to the most recent cutscene, not the tussle at hand.

Fans of the original may also take issue with the simplified controls, whereby dial-a-combo super-spell Magicks become D-pad or number-key shortcuts. The upshot is that *Magicka 2* is easier to grasp, but no longer demands feats of deft typing (though these are still possible). A more universal problem is that deep enemy health bars and little variation in elemental weaknesses per mob encourages casting similar spells over and over.

Nonetheless, *Magicka 2* is an often-charming, afternoon-long multiplayer romp that can deliver explosive laughs with friends. It’s just a shame that the randomness it courts with its spellcasting seems to have bled into every change Pieces has made, conjuring a sequel that is only intermittently better than its predecessor, if still every bit as frantic.



You’ll win many battles without loss of life, but there are tense patches.

MASSIVE CHALICE

DOUBLE FINE EVOLVES XCOM’S DNA IN A FRESH DIRECTION.

Modern medicine may have slapped a sticking plaster on the fleetingness of life, but the greatest thematic triumph and most irksome management crisis presented by developer Double Fine’s homage to *XCOM: Enemy Unknown* is that it confronts you with human impermanence. Not yours – your essence is undying, bound to the titular Chalice – but you sit on the throne of a kingdom being assaulted by a colourfully lethal threat called the Cadence. Your people’s only hope is for heroes of blessed blood to fend the beasts off for long enough to allow the Chalice to charge up a monster-obliterating wave. The catch? It’s a 300-year process, so generations will pass before you’re done.

Those in-game centuries will be spent building up your besieged island kingdom, which floats in a sea of tangerine Cadence yuck. It’s a stop-start process of fast-forwarding through mortal lifetimes, the advance of years auto-paused when key decisions arise. Some are almost always gripping, such as text events with no obvious answers, or what to research next. Others are variable, such as who to manage your Keeps, where you establish bloodlines and twisted genealogies. While the latter will define your game at first, finding replacements for custodians with mayfly-like lifespans does grow wearying once you’ve established enough houses that heroes aren’t in short supply.

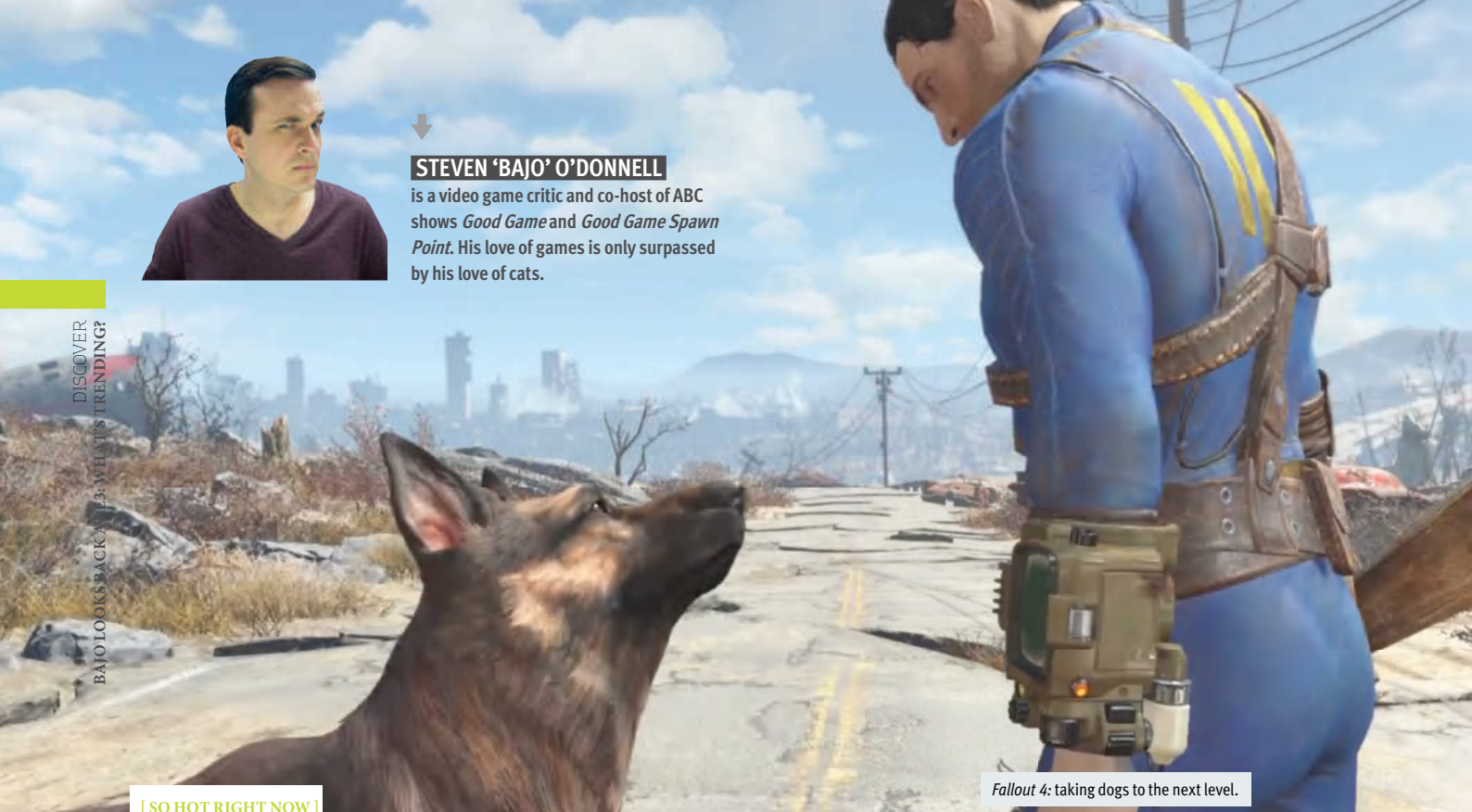
The bigger portion of a playthrough, however, is dedicated to guiding five heroes in turn-based battle. The two-phase moves and ability-heavy combat are familiar, but slightly less substantial than their clear ancestor, only irregularly generating the same gripping sense of peril and of gaming the odds. Still, in the Cadence, Double Fine finds cheeky new ways to vary the rules. Twitchers can teleport, but do so by swapping places with a hero, scattering formations; Wrinklers age their targets five years with every hit. It doesn’t matter how thick your armour is if your heart just stops. Not that you’ll get too attached to individuals – natural ageing means even your best heroes can’t dodge the Reaper for long – but where *Massive Chalice* breaks away from its inspiration is in the things that do last. Raise a high-level hero and they might leave behind a Relic, a weapon bequeathed to their house. These level independently and, when combined with the trickle down of XP through generations, create the sense of your grand houses growing in might, even if zooming out that far does detach you from their members. Beautiful and varied, *Massive Chalice* has the bearing of a great house itself. Its escalation to a meaty endgame is novel, but pestering relatives and a paucity of hardships in combat hold it back from greatness.

US\$19.99
PC, Mac
www.massivechalice.com



STEVEN 'BAJO' O'DONNELL

is a video game critic and co-host of ABC shows *Good Game* and *Good Game Spawn Point*. His love of games is only surpassed by his love of cats.



Fallout 4: taking dogs to the next level.

[SO HOT RIGHT NOW]

Bajo looks back: E3's top trends

E3 2015. WOW. WHAT AN E3. THE BEST EVER, IN MY OPINION. SUCH GAMES. SUCH EXCITEMENT! SUCH TECHNOLOGY! MUCH DOG. LET ME TAKE YOU BACK TO JUNE 2015, AND TO WHAT TRENDS EMERGED FROM THE WESTERN WORLD'S BIGGEST VIDEO GAME CONVENTION.

[STEVEN 'BAJO' O'DONNELL]

VIDEO GAME EXPOS are always exciting. Seeing developers spruiking their games with a delightful mix of fear and passion reminds us that there are real people (a LOT of people) pouring their hearts and souls into these games, not just some corporate machine churning out the next *Shoot Punter 7*. (I wish that game actually existed.)

Developers are passionate about their art, and you can see it in their eyes, especially when the crowd cheers. There were many cheers this year, with almost every press conference knocking it out of the park. All

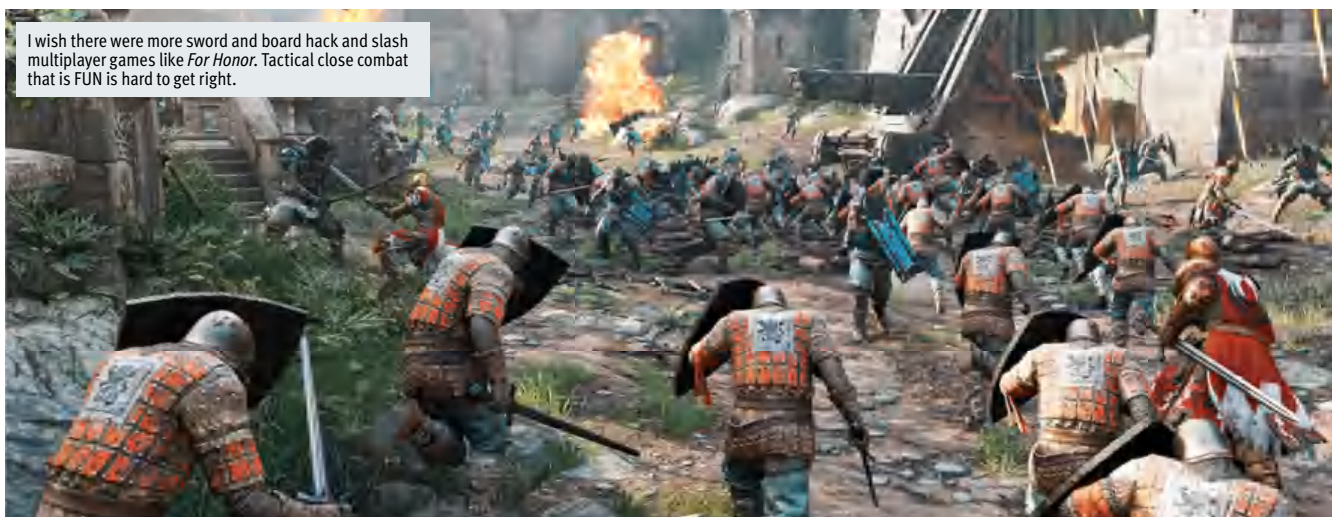
except for the new 'PC conference'. Because it was bad. It was so bad. Don't even look it up. Pretend it never happened.

What I really find interesting about E3 is you get a real sense of the headspace that developers are in, and hints of those little trends that are emerging. Little ideas borrowed and evolved, becoming visible simultaneously through a bunch of different games. Design choices which are representative of what new technology has allowed developers to do, but also the way in which games organically grow borrow ideas from one another.

TREND NUMBER ONE: OUR SANDBOX GOT BIGGER

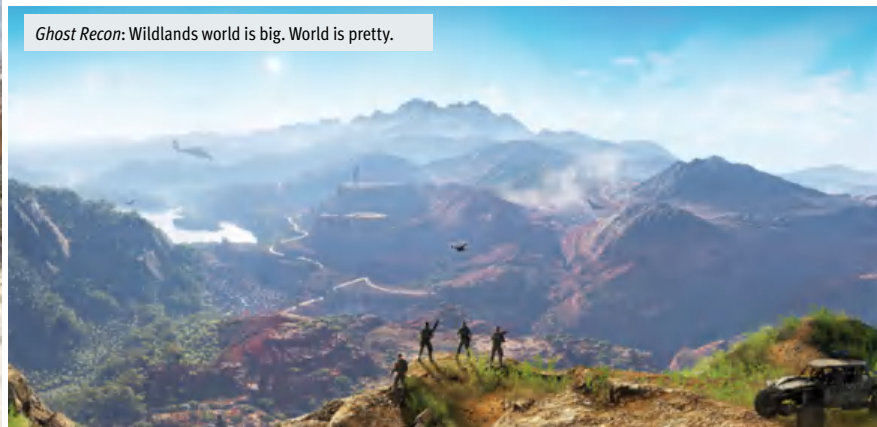
OK, a fairly obvious one. But still important. This year, we saw worlds grow in more ways than one. We've seen the draw distance restrictions of last gen fade away into a fog of the past. Worlds were truly massive in size, scope, and detail. *Fallout 4*, of course, is going to be a big game in all respects. I need it. Now. I need to build a house and live in it and collect everything and then just look at it in my house. And maybe build a flashing wang on the top. *Just Cause 2* was already a massive big and

I wish there were more sword and board hack and slash multiplayer games like *For Honor*. Tactical close combat that is FUN is hard to get right.

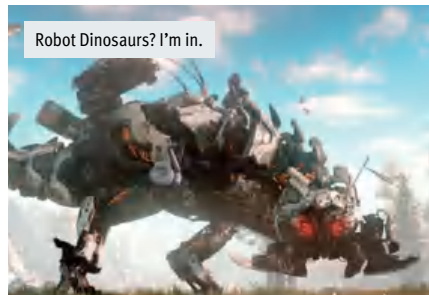




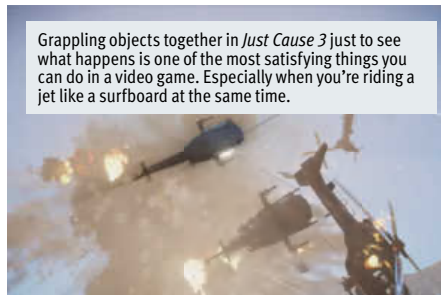
Metal Gear Solid V: Yes... yes... collect all the sheep.. I don't know why.



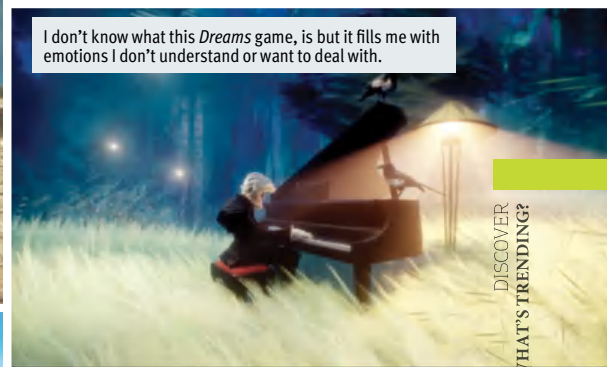
Ghost Recon: Wildlands world is big. World is pretty.



Robot Dinosaurs? I'm in.



Grappling objects together in *Just Cause 3* just to see what happens is one of the most satisfying things you can do in a video game. Especially when you're riding a jet like a surfboard at the same time.

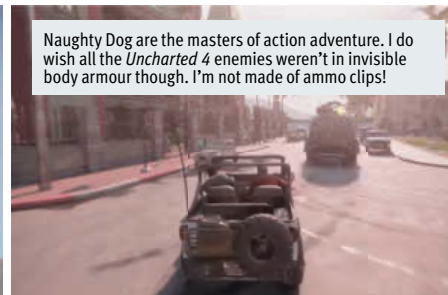


I don't know what this *Dreams* game, is but it fills me with emotions I don't understand or want to deal with.

DISCOVER
BAVO LOOKS BACK AT E3: WHAT'S TRENDING?



Fallout 4 won E3. It's all anyone could talk about for days. Christmas is cancelled, we will all be playing *Fallout 4*.



Naughty Dog are the masters of action adventure. I do wish all the *Uncharted 4* enemies weren't in invisible body armour though. I'm not made of ammo clips!

incredibly beautiful game. Its sequel, *Just Cause 3*, may not be bigger in terms of physical size, but it's certainly more detailed and populated. Apparently you'll be going underground a fair bit!

I just love open worlds. They amplify escapism. Like you really are visiting another world. It's the franchises which have moved to open world design that excite me the most. *Metal Gear Solid V* is an ambitious game where you also get to steal animals with balloons.

But I think *Ghost Recon: Wildlands* stole the open world award. Firstly, it's nice to actually be excited about a *Ghost Recon* game. I've always had a soft spot for the series, but they were never really a must play. *Wildlands* looks like it's incorporating much of the juicy tactical play of the original games, but throwing it into an astonishingly huge open world. I just hope it's got plenty of stuff to do in it.

TREND NUMBER TWO : WOMEN

We also saw a stronger female presence in both E3 presentations, as well as in the games themselves. Faith is back for *Mirrors Edge Catalyst*. The robot dinosaur hunting game *Horizon Zero Dawn* features a female protagonist as well. It's also a real departure from Guerrilla Games, makers of the *Killzone* series. Lara is back in a new *Tomb Raider* and

The Walking Dead's bad-ass sword wielding Michonne is getting her own spin off.

And both *Dishonoured 2* and *Assassins Creed: Syndicate* have playable female characters... the list goes on. About time. This trend needs to continue of course, so we can stop calling it a trend, and female protagonists become just a part of the regular gaming landscape — not an exception to the standard.

TREND NUMBER THREE : NEW IP'S

A few developers are also leaving old franchises behind and trying their hand at new things. The most stunning and curious of which being *Dreams* from *Little Big Planet* creator Media Molecule. What is this game? Do you make movies in it? Do you make games in it? Is it made of pure tears that you cry into your controller? I don't know.. probably. It's certainly the most curious piece of video game... thing... I have seen in a while.

TREND NUMBER FOUR: MULTIPLAYER ONLY FOCUSED GAMES

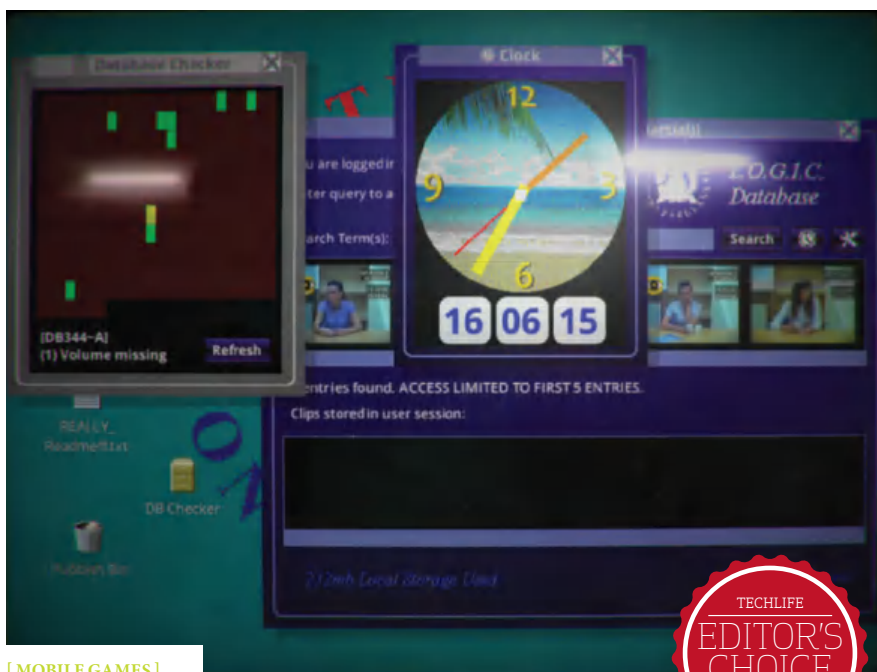
Now, there weren't many of these, but the ones that there were, are notable. *Battlecry* appeared again with its 'retro futuristic weapons', in a world with no gunpowder. If hack and slash is your thing, you might want to keep an eye on *For Honour*. This medieval battle game might

remind you of the excellent beautiful hilarious and magical *War of the Roses*. The big difference is, it has 'dat Ubisoft polish.

Massive scale battles beautiful maps and character model, and you get the sense they are aiming to make sword play both strategic and accessible. Multiplayer swordplay is a tough thing to get right, and so few games have pulled it off. Fingers crossed!

TREND NUMBER FIVE: INTERFACE

For honour speaks to the final trend which I think is the most important, and that's how we connect to these games physically, through the controller. We still have VR and the curiously futuristic augmented holographic reality of HoloLens to look forward to. But these could end up being more gimmicks than main stayers. What I'm talking about is how we do what we do in these games. The way we make our characters move, jump and leap. Our actions, in tune with theirs. The way we fight and move our way through these worlds is evolving. You just have to look at the way *Uncharted 4* chains together mid-air fist punches with grapple swinging to get a sense of how games are getting better interpreting our intentions and inputs. I think the next few years will be an interesting time for us to punch faces in new and ever more exciting ways. ■



[MOBILE GAMES]

Killer?

TECHLIFE REVIEWS THE LATEST GAMES FOR MOBILES AND TABLETS, STARTING WITH A NEW TAKE ON THE MOTION-VIDEO MURDER MYSTERY.



[IOS, PC, MAC]

HER STORY

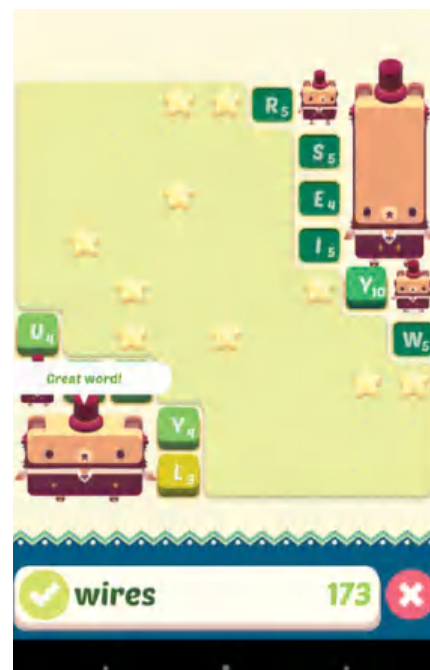
WITNESS A NEW KIND OF DETECTIVE GAME.

\$6.49 | www.herstorygame.com

THE YEAR WAS 1994, and in the course of a missing persons investigation, seven police interviews with the absent man's wife were conducted. Now, years later, you rake over the archived footage, which has been fragmented up into clips and scrambled within a computer database, to discover what really happened. That's as much of the narrative as we intend to recount here. Sam Barlow's astonishing vindication of FMV games is like any great detective yarn: the less you know going in, the better. *Her Story* is, as you might have deduced from the name, entirely about plot, with no traditional puzzles to solve, and no quiz at the end to check if you understood the real sequence of events. But what makes it so special is the unique way you experience that tale: out of sequence, and entirely at your own pace. Each clip is accessible from the first minute, your ability to view them only limited by whatever you can think to type in, and the archaic LOGIC database, which can only display the five most relevant hits to your search terms. The latter runs on a delightfully nostalgia-inducing reconstruction of a Windows 95 desktop, so it's easy to forgive its restrictions, but you're going to need to do some serious sleuthing to discover terms specific enough to see every last one of the 271 fragments of the story. And that's why no game has ever made us feel as much like a true

detective, despite such minimalist mechanics. Shorn of flashy CSI gadgets, rooms to inspect, or subjects to question, you'll have to rely on your own squishy grey matter to work out what adds up and what doesn't. Whether you process that best by notebook or mind palace, you'll digest clips and hunt for new information to turn into keywords, and to peel away another layer of the tale. It wouldn't work at all if actress Viva Seifert wasn't up to the task, but she carries off a performance that requires both nuance and ambiguity with remarkable assurance. Not every scene feels completely natural, but then the nature of a crime story demands a few moments you can't take at face value. The framing helps lend credibility to events too, the screen filled with fuzzy CRT scan lines and reflecting bars of neon strip lights behind your researcher, restrained music building a mood that amplifies the unease of prying into the case. It's a haunting game that will stick with you long after you choose to log off the terminal for good and, much like a great TV show, it's open-ended enough to get you swapping theories with friends. There are times when you might want a little more to do, and certainly there are many non-essential clips to filter, but there's also a purity here of deduction and interpretation that few other games would dare attempt. Grab your deerstalker, brush up on your Googling skills, and prepare for one hell of an investigation.

[MATT CLAPHAM]



[ANDROID, IOS]

ALPHABEAR

WORDS WITH POOH AND FRIENDS.

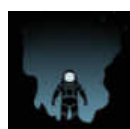
Free with IAP | spryfox.com

Done *Words with Friends* to death? *Spelltower* lost its shine? Say hello to the new word game that will have you hooked. *Alphabear* has a simple premise. Tiles appear on screen, and you make words with them. Every time you make a word, the letters are replaced by cartoony and downright adorable bears, and new tiles appear around the perimeter of the ursines. Bigger words equates to bigger bears, and thus a larger score. The catch is that the tiles last for a limited amount of turns — fail to use your surplus and they turn to rocks, scuppering the chance for a screen-filling Yogi and subsequent haul of points.

There's more to it, as you can employ buffs to increase your end-of-stage score, or boost the points earned for using certain tiles during a match. Like the best free-to-play games, it's absolutely possible to not pay a cent, though you'll have to wait for the countdown timer for your buffs to recharge, or watch an advert to start a stage early. However, like your favourite snackerel, this one's particularly moreish.

[PAUL TAYLOR]





[ANDROID, IOS (UNIVERSAL)]
LIFELINE...
 HELP SOMEONE LOST IN SPACE FROM YOUR SMARTPHONE... OR APPLE WATCH.
 \$3.79 | 3mingames.com

Something that becomes apparent when you have an Apple Watch is that most games created for it don't really work. They're not suitable for how the device is used. However, *Lifeline* is an exception, and while it also works well on iOS devices, it's tailor-made for Apple's wearable. The game starts with you receiving a communication from Taylor, a marooned astronaut. They're keen to survive and clearly terrified, despite a facade of morale-boosting humour. Decision-making is clearly not a strong suit, however, and that's left to you. At certain points in the conversation, you'll get a choice of actions, and Taylor will do what you say. We've seen this *Choose Your Own Adventure*-style structure plenty of times on iOS, but this game is lifted by some excellent scripting and the way it plays with time. For example, when Taylor has to hoof it across the planet's surface, your next communication may not be for hours. And you can't help but wonder what's going on in the interim. The result is an intimate and surprisingly emotionally-charged slice of interactive fiction that will give you a genuine buzz every time you get a tap on your wrist.

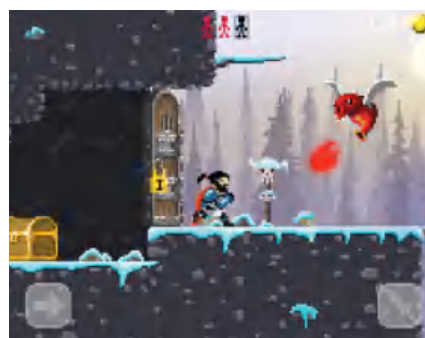
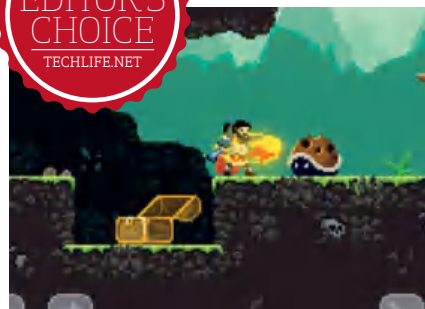
[CRAIG GRANNELL]



[ANDROID, IOS]
SPROGGIWOOD
 PUTTING THE "AWWWW" IN DUNGEON CRAWLER.
 \$12.99 | freeholdgames.com

Sproggiwood costs a premium price by mobile game standards, but it lives up to it. It begins with a young farmer boy on a top-down playing field, being led off by some sort of sheep. It's cute, irreverent and surprisingly well written, with charming and occasionally funny dialogue in between randomly generated dungeon crawling. The randomness of the dungeons lets it down, sadly — respawning enemies, trapping yourself in a corner and the chore of having to re-level each time you enter a new dungeon can rapidly unite to make an incredibly difficult, if not impossible, situation. When the going is good, though, it can be great, as you hack and slash your way through hordes of enemies, learning their attack patterns and upgrading your own. You can switch classes as you unlock more, change up your weapons and accessories to get the best loadout, and build your little town back home to give you more perks and classes. It's satisfyingly pacy, with several levels and loot chests throughout each dungeon, ending in a different kind of turn-based boss battle each time. The controls are intuitive enough for touchscreen, so it works well on the go — though check your device is supported.

[KATE GRAY]



[ANDROID, IOS]
SWORD OF XOLAN
 JUST REMEMBER TO STICK 'EM WITH THE POINTY END.
 Android, free with IAP; iOS, \$3.79
 www.swordofxolan.com

At their basest level, platform games are really about three things: jumping, hitting things, and dying. You can throw in as many fancy enemies and artfully designed stages as you like, but you still need to have that trio of basics nailed. Thankfully, *Sword of Xolan* has. You're a warrior tasked with ridding the land of vile beasts because... actually, we forget, because we were having too much fun scuttling about and generally being a badass. But fear not: there are plenty of vile beasts to be bested in satisfying fashion, whether that's up close and personal or at a distance. The former is your simplest move — a quick sword-slash, effective when teamed with jumps and nimble dashing so that you keep foes just at the edge of your attack radius. Your ranged fireball is a far more efficient way of dispatching enemies that, say, spit projectiles of their own — but can only be deployed a certain number of times before needing a top-up in the form of a potion. It means you need to be canny, firing only when necessary lest there be a dearth of refills in the vicinity. If this all sounds pretty simple, it is — but it's also a joy to master. Jump distances are pleasingly easy to judge, hitting things feels just weighty enough, and although death comes thick and fast (whisking you back to the start of the level, which is usually just far enough to feel like a punishment) always feels like your own idiot fault. Platforming 101? Passed with fireball colors.

[EMMA DAVIES]



TEST REPORT



Pencil by FiftyThree

THIS STYLUS IS A WORK OF ART THAT LETS YOU WORK ON ART.

Designed to be used in conjunction with the Paper by FiftyThree iOS app (see 'Must-have iOS apps', *TechLife* issue 40), Pencil by FiftyThree is perhaps the most beautiful (and useful) stylus you're likely to come across. Available in three finishes (Walnut, for that organic wood-feel, and the darker, more visually consistent Graphite, and Gold, for you flashy types), the stylus resembles a carpenter's pencil, only with a rubberised tip and eraser. Chargeable via USB, Pencil can be synced to your Paper app, ensuring that only it, not your palm, will leave marks your screen. The tip's wedge shape allows for angled pen strokes that translate nicely on the screen, as the app was recently updated to include surface pressure recognition. The eraser portion works particularly well, though with the app's rewind functionality, you may not need to use it all that often. Pencil is also compatible with a range of other apps, including Adobe's Illustrator Draw, Illustrator Line, Photoshop Sketch and Photoshop Mix apps. Highly recommended.

[STEPHEN LAMBRECHTS]



PENCIL BY FIFTYTHREE

From \$70
www.fiftythree.com/pencil

CRITICAL SPECS

USB chargeable, replaceable tips, compatible with iPad 3, 4, Air (all) & Mini (all), connects via Bluetooth LE (Low Energy).



GIGABYTE P55W V4

\$2,299
www.gigabyte.com.au

CRITICAL SPECS

Windows 8.1 (64-bit) upgradeable to Windows 10, 15.6-inch LCD screen @ 1080p, quad-core Intel Core i7-5700HQ CPU (2.7-3.5GHz), Nvidia GeForce GTX 970M GPU, 8GB memory, 128GB Liteon SATA 6Gbps SSD, 1TB Hitachi 7200rpm hard drive, 2.63kg (laptop), 700g (charger)



[GAMING LAPTOP]

Laptop gaming for less

THE *TECHLIFE* TEAM TESTS THE LATEST GADGETS, PCS AND ACCESSORIES.



Gigabyte P55W v4

CAN YOU GET TOP GAMING PERFORMANCE AT A REASONABLE PRICE?

BASED PURELY ON specs, Gigabyte's new P55W v4 gaming laptop gets off to a solid start: it's about the cheapest 15.6-incher that combines a Core i7 CPU, GeForce GTX graphics chip and both an SSD and secondary hard drive for storage.

That Nvidia GeForce GTX 970M, in particular, drives gaming with gusto. With Ultra graphics settings at the screen's native 1080p resolution, you'll get around 40-50fps in newer titles and 70-80fps in slightly older, less-demanding games. Those are most-definitely playable framerates, and you can often double them by turning the detail settings down to High. The CPU is a speedy quad-core i7-5700HQ, outperforming the previous-gen i7-4710HQ (seen in other laptops around this price) by around 5-10% in CPU-intensive tasks, like media encoding. Even the storage is better-than-average. While that 128GB main SSD is a little smaller than we'd ideally have liked (a 256GB would give you more room for games, which realistically will need to be stored on the secondary 1TB Hitachi storage drive), although just having an SSD at this price really is a bonus — it makes a huge difference to boot time and overall system responsiveness.

The P55W does have some drawbacks. It's not particularly portable; at 2.63kg for the laptop and another 700g for the charger, it's venturing into the 'pull your shoulder off' zone. And battery life and heat could both be better. At most, you'll see 2:30hr from the battery (so it's good for short jaunts only), and the CPU and GPU hit a toasty 95°C/83°C respectively under load; that's within specs, but is flying close, particularly when it comes to the CPU.

Some shortcomings are to be expected at this price though and, on the whole, this is a solid choice if you're on a tight budget but want all the performance you can get. [DAN GARDINER]





Jabra Move Wireless

CHEAP HEADPHONES WITHOUT THE CHEAP SOUND.

WITH THEIR EYE-CATCHING matte red-and-black finish, you'd be forgiven for assuming Jabra's Move Wireless cans are a Beats-inspired example of style over substance. Happily, these Bluetooth headphones deliver decent sound and impressive battery life at a modest price tag, all of which gives them an edge over their Apple-owned rivals.

Incredibly light, the Jabras make an excellent workout companion. They're supremely comfortable — you may forget you have them on — and remain firmly in place without gripping your noggin too tightly. While the cans don't fold, their modest dimensions mean you'll have no trouble fitting them in your gym bag.

Sound is the biggest surprise here. Satisfyingly full, the Jabras deliver a balance between punchy bass, mids and highs, and impressive volume for their size. Sure, the audio experience can't compare with the likes of the Parrot Zik 2.0, but then these Jabras will cost you less than a third.

Calls are similarly polished. Audio's always clear and you don't need to shout for the inbuilt microphone to pick you up, so no more angry stares on public transport.

Battery life is also strong. Jabra quotes 8 hours of talk, and the cans last for days on standby between listening sessions, so you'll have no fear of your music running out before your workout's over.

In addition to their fetching red finish, Jabra's Move Wireless cans are available in blue and black. For quality audio to accompany your next workout, you'd be hard pressed to find better in this price range.

[ROB EDWARDS]



Marshall Monitor

FOR THOSE ABOUT TO ROCK WE SALUTE YOU.

IF YOU GREW up in the glorious 80s you've probably used, lugged and maybe vomited on a Marshall speaker stack or two. The company's logo is hidden in the background of numerous nameable rock-band pics and emblazoned on the T-shirts of people who want you to know they're into music. And now Marshall makes headphones, too.

The build quality, niceties and attention to the smaller details in this set is faultless; the Monitors look amazing and definitely capture the rock flavour of the brand. The textured and stitched vinyl headband feels great in the hand and on the head, and the gold-plated accents and tiny, coiled wires to the cans are a nice touch. The semi-coiled cable is also ingenious; the lower two-thirds is a traditional straight cable, but the top section just below the inline mic is coiled. It means if it gets caught up in your jacket or backpack there's still some stretch and movement.

Another really cool feature of the Monitors is the removable Felt Treble Filter — essentially a disc of super dense felt — that's fitted in each can. The ear padding is attached to the shell with strong magnets that, once yanked off (just be careful not to strip the padding from its housing like we nearly did) reveals the FTF. Removing these slightly tweaks how the trebles come through; with the FTF in place, music sounded a lot thicker in the lower end, which is fine if you're throwing up horns listening to some RAWK, but for anything with more of a complex range of trebs and highs it felt like listening to the group though a wall. Sans FTF, the mids and highs have more presence and an overall far more pleasurable, albeit still bass-aggressive sound.

While the Marshall Monitors ooze style, if it's a pair of studio-quality headphones you're after it'd ultimately be tough to recommend these over something like the cheaper Audio-Technica M50X.

[TROY COLEMAN]



JABRA MOVE WIRELESS

\$95
www.jabra.com.au

CRITICAL SPECS

40mm drivers, 20Hz – 20KHz frequency response, 94dB sensitivity, 32ohm impedance, 3.5m audio cable included, 150g without cable and connector.



MARSHALL MONITOR HEADPHONES

\$249
www.marshallheadphones.com

CRITICAL SPECS

40mm drivers, 10Hz–20KHz frequency response, 99dB sensitivity, 42ohms impedance, carrying pouch included, 248g without cable





Nikon D7200

AN UPDATE TO A FAN FAVOURITE ENTHUSIAST DSLR.

NIKON'S SET ITSELF a seemingly herculean task: update its well loved D7100 with more than a mere refresh. We'll spoil the surprise now and say that they've done it, thanks to a new sensor that excels in low light and smart user-friendly connectivity.

First glimpses suggest the D7200 hasn't changed much from its predecessor. Not a bad thing, as the weather-resistant body of the old camera proved it to be a warhorse, and it's still as comfortable in your right hand, despite its relative heft. It's under the surface though where the real changes lie, as the Expeed 4 sensor eliminates low-light banding. In the past you'd have to work in post processing to get rid of those odd horizontal lines — that's now been eliminated.

Impressively, you're also going to get approximately an extra 160 shots out of the battery here, thanks to the improved circuitry. Images from ISO 100 up to 800 produced clear shots, and it's only in the higher ISO range where noise starts to creep in, and we tested with the 18 — 140mm lens. It's also a camera that's taking steps to be more user friendly — while smartphones can't compete with DSLR's image quality, they're connected to the internet, meaning snaps can be immediately shared. The D7200 employs a few tricks from its cousin, the AW-1, and features NFC for easy transfers. Wi-Fi connectivity enables remote control from your phone.

It's not perfect. Although there's a live-view option on the rear LCD screen, it's firmly locked in place — the vari-angle monitor built into other cameras is annoyingly absent here.

[PAUL TAYLOR]



Imation Link Power Drive

A RECHARGEABLE MEDIA EXPANSION DRIVE FOR IOS.

ONE OF THE most common gripes against the iOS platform is the lack of storage, particularly on entry-level iPhones and iPads. This problem is so common that last year, lawyers kicked off a class action lawsuit in California specifically protesting the latest OS's footprint: it takes up around 20% of a 16GB Apple device's advertised storage space.

That wouldn't necessarily be a problem if Apple offered microSD card support — like some Androids — but it doesn't, meaning if you want more space you'll need to shell out a stack of bills to upgrade to the next model up.

If you're one to feel significantly disgruntled by this, but not quite frustrated enough to try your luck with an Android, the Link Power Drive (LPD) may be exactly what you're looking for. This iOS accessory from the New Zealand company Imation is an external storage unit and power bank all-in-one. With the option of 16, 32 and 64GB models, the highly portable charging cube can effectively double the amount of files (think documents, videos, music and images) you would normally be able to use on your Apple device. A built-in 3,000mAh battery means that the LPD also theoretically has the capacity to charge an iPhone 6 one and a half times while out and about.

There are a couple of caveats though. Alongside a slightly premium street price of \$99 for the 16GB model, like other external storage devices the LPD's extra gigs can only be accessed through a dedicated app on your phone or tablet. The limitation of connecting through that app is that you can't store applications or games on it so it only really increases the space for your media and documents. That said, its inbuilt device stand, storage space and recharging perks do make it perfect for watching movies on long commutes.

[JOEL BURGESS]



NIKON D7200

\$1272

www.digitalcamerawarehouse.com.au

CRITICAL SPECS

24.72MP (6,000 x 4,000), 23.5mm x 15.6mm (DX, CMOS) sensor, 3.2 inch fixed LCD, SD card store, 100 – 25,600 ISO (full colour), boost to 51,200-102,400 (black and white only), 1080p @ 60/50/30/25/24fps video, hot shoe for external flash + on board pop-up flash, 675g (body only).



IMATION LINK POWER DRIVE

16GB, \$99; 32GB; \$129
imation.com

CRITICAL SPECS

3,000mAh battery, retractable phone stand, USB 2.0 and Lightning connectors, compatible with iOS7+ and iPhone 5 and above, 73mm (L) 64mm (W) 22mm (H), 110g.





Polaroid Cube

THINKING OUTSIDE THE CUBE.

THE NAME POLAROID has long been synonymous with instant photography. So it's a bit of a surprise that Polaroid have introduced an action video camera to its line-up.

The Polaroid Cube, as its name suggests, is a small action video camera in the shape of a small cube, measuring at just over 3cm cubed and is one of the smallest action cameras on the market. It's a small enough camera to keep in your pocket or handbag. A magnetic base allows you to attach it to anything metallic without the need of a mount, such as a car.

The lens' viewing angle on the Cube is 124°, which is narrower than some of the other cameras on the market, but is still wide enough to capture a decent frame, despite the fact that you're guesstimating your framing without the visual aide. The video quality is quite good for the price. Performance is best in daylight. However, it can still be used in low light situations, perhaps with a little bit of noise. Battery life is about 90 minutes.

Polaroid have a range of accessories including various mounts for helmets, bikes, tripods and wrists. They also have a waterproof case that comes with a suction mount. In our test, the suction mount wasn't very effective, falling off the car twice in the space of about 5 minutes, due to what seemed like the vibrations of the road.

For the price, this is a great little action camera for the casual video enthusiast.

[THOMAS DANG]



Polaroid Socialmatic

INSTAGRAM LOOKING CAMERA.

THE SOCIALMATIC IS a camera in which the concept was born from the popularity of Instagram and traditional Polaroid instant photography cameras back in 2012, when it was originally touted as the Instagram camera.

The Socialmatic is essentially an instant digital camera, taking visual design cues from Instagram's app icon. Running on Android OS, it features a 14MP front camera with an LED flash just above the lens, a 2MP rear camera, 4.5-inch touch screen and most importantly the ability to print 2 x 3-inch colour photos using the ZINK printing technology that has been used in previous Polaroid instant digital cameras.

Main functionality is accessed via the Socialmatic app, which allows you to take pictures, edit them and then print them. The beauty of Polaroids is that it's low-fi photography and aims to be fun to capture moments. Whilst this Socialmatic succeeds in the low-fi department, the user interface gets in the way of this being a truly fun camera to use to capture moments.

The user interface of the Socialmatic app is rather confusing and lacks intuition. Unfortunately the LCD touch screen isn't bright enough to use in outdoor settings and the touch sensitivity doesn't seem to work very well — often you struggle to swipe up to go back and miss press a button.

This camera showed a lot of promise in its concept stages to be a fun camera that embodies the fun that Polaroids are known for. Unfortunately as it's not the easiest camera to use, we'd recommend waiting for an updated model.

[THOMAS DANG]



POLAROID CUBE

\$149.99

www.polaroid.com.au/cube

CRITICAL SPECS

1080p (30fps) / 720p (30fps), Image size: 6 MP, Storage: SD Card (32GB max).



POLAROID SOCIALMATIC

\$458

www.polaroid.com.au/

CRITICAL SPECS

Image Size: 14MP (4192 x 3104), Screen Size: 3.5-inch, LCD touchscreen, Storage: micro SD Card + 4GB internal storage, Weight: 570g (battery included), ISO Sensitivity: 100-800, LED flash.



[PLAY]

New age toys for kids and the young at heart

WHETHER IT'S PLAY TIME OR HOMEWORK TIME, THESE SMART GADGETS ARE MUST-HAVE ITEMS FOR THE MODERN SCHOOL KID.

[JENNETH ORANTIA]

'SMART' TECHNOLOGY ISN'T just for the grown ups. Kids toys and educational items are quickly catching up, and many of the more up-market devices are boasting built-in Bluetooth or Wi-Fi, along with 'enhanced' functionality when paired with a compatible smartphone or tablet.

There are certainly benefits to this approach. Being able to incorporate features that take advantage of the touchscreen controls on a mobile device make the interaction possibilities nearly endless, which is ideal for keeping young minds entertained and engaged. However, the added electronics that are required to make this integration possible inflate the pricetag considerably, which raises the obvious question of whether you want to spend that much money on something that's bound to get broken or lost in a few months anyway.

Perhaps more promising from a parent's perspective are high-tech devices that can be used for educational purposes, including smart pens and styluses. These work with tablets to enhance the note-taking process, mixing old-world penmanship with the benefits of digital capture.



Parrot Minidrone Jumping Sumo

THE SNEAKY SPY ROBOT.

IF YOU'RE LOOKING to do some recon on the rest of the family, the Jumping Sumo is a sneaky way to do it. This small, smartphone-controlled robot gives you a VGA-quality video stream of everything it sees from the ground level, and using the app's touchscreen controls, you can roll, spin, flip, and even have it jump straight up or leap forward up to 80cm.

The on-board camera and ability to jump short distances lifts it above the realm of a standard-remote controlled car, but the 20-minute battery life and 1.5-hour charging time means you can only enjoy it in short bursts. You can capture photos through the app and download it to your phone, but if you want to record video, you'll need to attach a USB drive with a micro USB connector (such as Toshiba's Duo 2 in 1 flash drive).

Connecting to your smartphone or tablet over Wi-Fi rather than the more common Bluetooth means it can travel roughly three times as far from your mobile device (or up to 50 metres).

Parrot Minidrone Rolling Spider

A KID-SIZED DRONE.

THINK OF THE Rolling Spider as a drone on training wheels, and we don't just mean because it's cheaper. It actually has two large wheels flanking either side of the quadcopter body, enabling it to crawl up walls and across the ceiling. You can remove the wheels if you want better aerodynamics, but we wouldn't recommend this indoors due to the spinning propellers (plus they work well as protection when the Rolling Spider inevitably crashes).

The Rolling Spider works much like its larger drone counterparts, only its small size makes it better suited for indoor use. A built-in VGA camera on its belly shoots photos from an overhead point of view rather than what it "sees". Unlike the Jumping Sumo, it connects to mobile devices using Bluetooth LE, so you're limited to a range of up to 30 metres, and its flight height is a maximum of 10 metres.

Its biggest limitation, however, is its skimpy battery life. As fun as it is to use, having to recharge it for 1.5 hours after only six minutes of playtime quickly takes the shine off.

HOW WE TESTED

All of the smart toys were tested within the limited confines of a small two-bedroom flat with both an Apple iPhone 6 Plus and a Samsung Galaxy Note 4. The smart pens and styluses were tested with an Apple iPad Air 2.



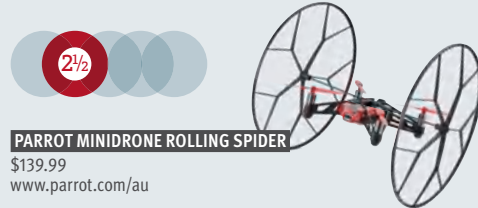
PARROT MINIDRONE JUMPING SUMO

\$219.99

www.parrot.com/au

CRITICAL SPECS

802.11ac, range up to 50 metres, up to 7km/h, 20 minutes battery life, 90-minute charging time, app compatible with iOS, Android, Windows Phone 8.1.



PARROT MINIDRONE ROLLING SPIDER

\$139.99

www.parrot.com/au

CRITICAL SPECS

Bluetooth Smart, range up to 20 metres, up to 18km/h, 6 minutes battery life, 90-minute charging time, app compatible with iOS, Android, Windows Phone 8.1.



Sphero Darkside Ollie

GOES THE DISTANCE.

THE DARKSIDE OLLIE is more or less the same app-controlled robot that Sphero launched last year, only with a dark coat of paint and a bit of a cheeky 'personality'.

Compared to the Parrot Minidrone Jumping Sumo, it's a case of one step forward, two steps back. Battery life is considerably better at up to 60 minutes, but the lack of on-board camera means you're likely to get bored of using the Darkside Ollie well before an hour's up unless you have an easily excitable cat.

It's probably more fun to use in pairs, as you can race them against each other over a variety of different surfaces at a maximum speed of 22km/h. The touchscreen controls, however, are difficult to master.

Also letting it down is the lack of compatible apps. On top of the main Ollie by Sphero app, you can use it with the Sphero Draw N' Drive and Sphero Macrolab apps, but it's missing the fun games and third party apps of the original Sphero robotic ball.



SPHERO DARKSIDE OLLIE

\$199.95
www.sphero.com

CRITICAL SPECS

Bluetooth Smart, range of up to 30 metres, up to 22km/h, 60 minutes battery life, three hours charging time, app compatible with iOS, Android.



Livescribe 3 Smartpen

HIGH-TECH WAY TO HANDWRITE.

UNLESS YOU'RE A well-known brand like Mont Blanc or Cross, you're going to have a hard time selling a pen for two hundred dollars. But then, the Livescribe 3 Smartpen isn't your garden-variety ballpoint.

An infrared camera embedded in the tip records everything you write on special Livescribe dot paper (a 50-page starter notebook is included in the box), and using Bluetooth, it displays and transfers everything you write in real-time to an iOS or Android device. From there, you can search across your handwritten notes, convert notes to text and record audio, as well as share your notes via email or print them. If you use OneNote or Evernote, you can set it up to send individual pages or automatically sync entire notebooks so that all of your notes are in one place.

The system works much better than trying to input handwriting into a tablet directly, but you'll need fairly legible handwriting to take advantage of the search and handwriting-to-text features. You'll also need to remember to charge the pen after every 14 hours of use.



LIVESCRIBE 3 SMARTPEN

\$199.95
www.livescribe.com/au

CRITICAL SPECS

Bluetooth Smart, length 162mm, width 14.9mm, weight 34g, 14 hours of battery life, app compatible with iOS, Android.



Adonit Jot Script 2

SEND YOUR SCRIBBLES TO EVERNOTE.

WE LOVE THE idea of handwritten notes on an iPad with the same fluidity and accuracy of paper, but sadly, the Jot Script 2 Evernote Edition isn't quite up to the task. It does some things right, such as the pen-sized proportions and fine-tipped stylus, but for the most part the handwriting experience is frustrating.

Like other Bluetooth styluses we've used, it can't keep up with quick scribbles, and will drop letters in every third or fourth word. The palm rejection doesn't work too well, producing errant marks or triggering one of the app's controls whenever our palm was resting on the screen. Finally, the parallax issue, which is where the ink on the screen doesn't appear directly underneath the stylus tip, makes it near impossible to write neatly.

The Evernote Penultimate app lets you search across notes, but there's no way to send notes to other people. For this, you'll need to sync your notes to Evernote (it comes with a free six-month Evernote Premium subscription), and then use the dedicated Evernote app to share notes and access them from any device.



ADONIT JOT SCRIPT 2 EVERNOTE EDITION

\$129.99
www.officeworks.com.au

CRITICAL SPECS

19mm tip, 20 hours battery life, built-in lithium ion battery, 18g.



THE
MOST FUN
YOU CAN
HAVE WITH
YOUR HANDS
WITHOUT
GOING
BLIND



WICKED WEARABLES

NEXT EVOLUTION OF COMPUTING, OR HOT-AIR & HYPE? WE UNCOVER THE WEARABLES THAT ARE ACTUALLY WORTH IT.

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Time for a new gadget?

YOU MAY HAVE STOPPED WEARING A WATCH YEARS AGO, BUT THE LATEST SMARTWATCHES OFFER A LOT MORE THAN SIMPLY TELLING THE TIME

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Banding together

THE WEARABLE MARKET IS EXPLODING, AS FITNESS BANDS BECOME MORE ACCESSIBLE THAN EVER BEFORE. HERE WE COMPARE THE BEST ON THE MARKET.

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CUT THE WIRES AND TURN UP THE SOUND - AND IMPROVE YOUR FITNESS - WITH THESE BLUETOOTH BEAUTIES.

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Specialised wearables

WE TAKE A LOOK AT SOME OF THE MORE NICHE SPORTS WEARABLES AND TRACKERS TO SEE WHICH ONES STACK UP.

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BENNETT RING DONS FOUR OF THE LATEST VIRTUAL REALITY HEADSETS TO SEE WHETHER ITS TIME HAS COME.

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Experience VR now!

SO, YOU'VE GOT YOURSELF A HEADSET. HERE'S HOW TO FIND CONTENT TO WATCH.

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The future of wearables

WEARABLE TECHNOLOGY IS SET TO CHANGE HOW WE LIVE AND WORK, BUT IS THERE A COST? LET'S INVESTIGATE WHAT'S IN STORE.

[WICKED WEARABLES - SMART WATCHES]

Time for a new gadget?

YOU MAY HAVE STOPPED WEARING A WATCH YEARS AGO, BUT THE LATEST SMARTWATCHES OFFER A LOT MORE THAN SIMPLY TELLING THE TIME.

[JENNETH ORANTIA]

DO YOU REALLY need another screen in your life? This is the question posed by the latest wearable gadget that's taking the consumer electronics industry by storm. Smartwatches are in many ways an extension of your smartphone. Connecting to your mobile device over a wireless Bluetooth connection, smartwatches give you a heads up of any new notifications or calls, and serve up bite-sized chunks of your personal information and apps in various formats.

In many ways, smart watches reduce the number of times you need to take your phone out of your pocket or bag. You can reply to text messages and emails and even answer calls right from your wrist; check the time, weather and any upcoming appointments; and use pared-down versions of your smartphone apps to do things like hail an Uber car or get turn-by-turn directions.

The available functions on offer differ between smartwatch platforms. Only Apple's watchOS and Tizen support making and receiving calls, while Android Wear and Tizen are the only ones that let you read entire emails and reply to them (watchOS and Pebble OS refer you back to your smartphone).

The more important distinction between the various smartwatch platforms, however, is the smartphone compatibility. The Apple Watch only works with iPhone 5 and newer models running iOS 8 and Samsung Gear S' compatibility is limited to Samsung Galaxy smartphones that run Android 4.3 and have at least 1.5GB of RAM. The most ubiquitous smartwatch platform is Android Wear, which works with any Android phone running Android 4.3 or higher, however Pebble OS offers the widest compatibility, with support for both iOS and Android.



Moto 360

AN OLDIE, BUT A GOODIE.

BY THE TIME you read this, the Moto 360 2 may have already launched, with promises of a higher resolution screen, smaller size, and no more 'flat tire' (which we'll get to shortly). But until then, the Moto 360 holds its own quite well despite being older than the other smartwatches on test.

The Moto 360 was the first with a round watch face, but in order to keep the bezel around the screen as thin as possible, it had to house the ambient light sensor in a small bar at the bottom — hence the 'flat tire' look. This shortcoming is easily hidden in black watchfaces, but it's painfully obvious when using one of the lighter ones. That said, we still prefer the Moto 360's design to any of LG's completely round smartwatches, which are still quite bulky on the wrist.

The Moto 360 shows its age through the older Texas Instruments OMAP 3 processor, resulting in pokey performance compared to its Android Wear rivals. The small 320mAh battery means you'll have to charge it every night, but since it uses a Qi wireless charging via the supplied dock, you could use the same charging mat as Qi-enabled smartphones like the Nexus 6 and Samsung Galaxy S6.

Its relative 'maturity' notwithstanding, there's still a bit of gas left in the Moto 360's tank. Upgrading it to the latest software adds new features that it didn't have out of the box, such as the ability to store music locally for direct playback (via Bluetooth headphones) and Wi-Fi functionality for receiving notifications from your smartphone when it's beyond Bluetooth range.

06

SMART WATCHES

HOW WE TESTED

All smartwatches were tested with either an iPhone 6 Plus (for iOS compatible devices) or a Samsung Galaxy Note 4 (for Android compatible devices). Each watch was worn for several days and its primary features were tested, alongside a range of first and third-party apps where applicable.



MOTO 360

\$329

www.motorola.com.au

CRITICAL SPECS

49g, 1.56-inch 320 x 290 LCD display, 320mAh battery, IP67 rating, Android Wear, TI OMAP 3 processor, 512MB of RAM, 4GB of storage, Wi-Fi, Bluetooth, optical heart rate monitor.





Pebble Time

LITTLE ROCK IN A BIG POND.

DESPITE BEING PEBBLE'S third smartwatch in as many years, the newest Time has something of a retro quality to it. Could be the dated-looking colour screen, which, while being an upgrade over the previous Pebble's monochrome display, has a limited and somewhat muted colour palette. It could also be the blocky design; a throwback to digital watches from the 80s. Still, it's something we'd expect to see on a hipster with a carefully-coiffed neckbeard and Che Guevara t-shirt.

This is not a smartwatch for anyone that's looking for all of the latest bells and whistles. It doesn't have Wi-Fi, GPS or a heart-rate monitor, it doesn't double as a music player or support voice commands, and it doesn't even have a touchscreen (it's operated using four side-mounted buttons).

But even with the uninspiring hardware design and lack of high-end features working against it, the Pebble Time still has a few redeeming qualities that keep it in the game. The first is that you won't need to plonk it on the charger every night like the other smart watches. The combination of its unique e-paper display and lower-end internal components means it can last for up to seven days — something that stood up in our testing.

The Pebble Time is also the only smartwatch that works on both iOS and Android (although you can do more with it when it's connected to the latter), and with a library of more than 8,000 apps (which includes PayPal, Evernote, TripAdvisor and Jawbone UP), you won't run out of things to do with it. For those that want to try a smartwatch, the Pebble Time offers a cheap way to test the waters.



PEBBLE TIME

US\$200
getpebble.com

CRITICAL SPECS

42.5g, 1.25-inch e-paper display, undisclosed battery capacity, water-resistant to 30 metres, Pebble OS, undisclosed processor and RAM, undisclosed storage, Bluetooth.



[BUYER'S GUIDE] SMARTWATCHES

WHAT TO CONSIDER WHEN
BUYING A SMARTWATCH.

COMPATIBILITY

Is the smartwatch compatible with your smartphone? BlackBerry and Windows Phone users are out of luck, although there are third party apps that enable the Pebble to work on BlackBerry.

FUTURE-PROOF

Will it work with your future smartphone? The latest smartwatches aren't cheap, and it's worth thinking ahead as to whether it will stand the rest of time (no pun intended).

HANDS FREE

Do you want to use it for making hands-free calls? Given the hefty fines for mobile phone usage in the car, this is a handy feature (again, no pun intended).

TRY IT ON FIRST

Have you seen it in person? Tricky photography can make anything look good, and since it's something you'll be wearing all the time, you should ensure you like the look and feel of it before buying.

COMFORT

Another advantage of seeing it in person is being able to check how it feels on your wrist. The current generation of smart watches are quite bulky compared to modern dress watches, but similar to a sports watch.

CUSTOMISE

Can you replace the watchband to give it a different look? The ease of finding a replacement will largely depend on whether it's a standard or proprietary style of band.

BATTERY LIFE

Is battery life an issue? If you're going from using a regular wrist watch, having to charge it nightly or ever other night can be tough to get used to.

APPS

If you're a power user, it's worth checking the apps that are currently available for each platform. Pebble has the largest volume, but watchOS offers more of the well-known names like Instagram and Twitter.





Apple Watch

IT'S SEXY AND IT KNOWS IT.

MORE THAN ANY other smartwatch, the Apple Watch looks and feels like an object of desire — especially as you move up the product range. Then again, that's to be expected, given the entry-level model is more expensive than its priciest competitor. You could, if you were so inclined, spend as much as \$24,000 on the top-of-the-range model.

The Apple Watch may be late to the party, but it's far from a me-too device. The Activity and Workout apps are a great example of how all smartwatch apps should look, with graphics and layout that are optimised for the smaller display. Ditto the 'Glances' feature, which gives you widget-style bites of information from your installed apps. There are plenty of impressive names in the Apple Watch App Store, too, including Evernote, Twitter, Uber and Instagram.

The platform as a whole, however, still feels undercooked. At this stage, you can't download new watch faces or create a custom one from your own pictures (this is coming in the next software update). Apps and glances take a while to load, and our review unit would spontaneously restart at least once a day.

The model we had on test was the 38mm Apple Watch with stainless steel case, sapphire crystal screen and stainless steel link bracelet: a sharp-looking dress watch that'll set you back \$1,399. But is it worth more than an iPad mini 2 and an iPhone 6 combined? Not exactly. It does some things better than the incumbents, but the smart thing would be to go with one of the entry-level models and wait for the platform to mature.



APPLE WATCH

From \$499
store.apple.com/au

CRITICAL SPECS

From 25g, 38-42mm Retina display, undisclosed battery size, IPX7 rating, watchOS, Apple S1 processor, undisclosed RAM, 8GB of storage, Wi-Fi, Bluetooth, optical heart-rate monitor, ambient light sensor.



LG Watch Urbane

QUITE THE CHUNKY MONKEY.

THE LG WATCH Urbane looks more like a traditional wristwatch than any of the other smartwatches on test, with a completely round, metal-encased face and handsome stitched leather straps, along with an always-on display that shows a low-paper watchface.

Like its Watch R predecessor, the 1.3-inch screen uses P-OLED technology that produces rich, inky blacks and vibrant colours with excellent viewing angles. The selection of pre-installed analogue watchfaces are far more attractive than we've seen on other Android Wear watches, too, which means less faffing about on the Google Play store.

Our main qualm with LG's newest smartwatch is that the oversized lugs on either side turn what could've otherwise been a reasonably sized watch into something that swallows regular wrists whole. This is the same issue that plagued its predecessor, the Watch R, which makes us question whether the hundred-dollar premium for the Watch Urbane is worth it.

Apart from the hardware design change, it's nearly identical to the Watch R, with the same 1.2GHz quad-core processor, 512MB of RAM, 4GB of storage, optical heart rate monitor and 410mAh battery. One feature that's new to the fold is Wi-Fi, and paired with the latest Android Wear 5.1.1 update, this adds the ability to connect to your smartphone over the internet and receive notifications when beyond Bluetooth range.

Whether the Wi-Fi and tweaked design are worth a 27% markup is another question. The Wi-Fi is a bit of a novelty at this stage, which means both LG watches offer what's arguably the best Android Wear experience. If you find the faux tachymeter on the Watch R to be tacky, then the Watch Urbane is perhaps the better option.



LG WATCH URBANE

\$459
play.google.com/store?hl=en

CRITICAL SPECS

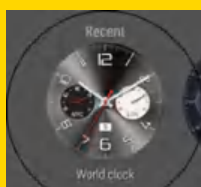
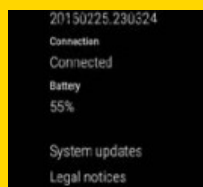
66.5g, 1.3-inch 320 x 320 P-OLED display, 410mAh battery, IP67 rating, Android Wear, 1.2GHz dual-core processor, 512MB of RAM, 4GB of storage, Wi-Fi, Bluetooth, optical heart-rate monitor.



Mastering Android Wear

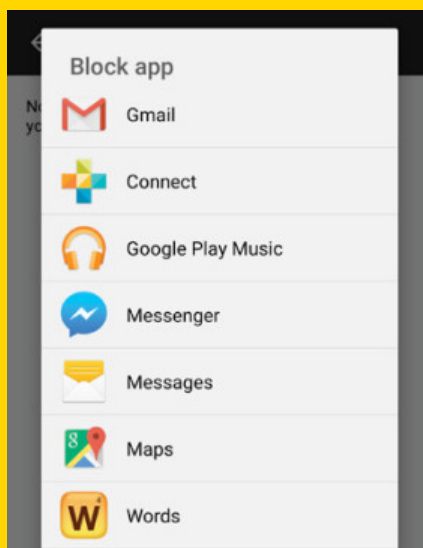
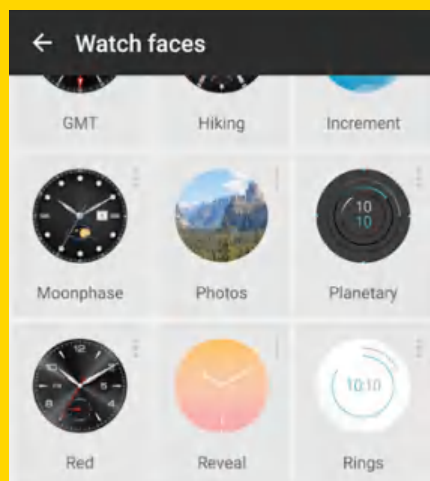
THE LATEST 5.1.1 VERSION OF ANDROID WEAR HAS MADE GOOGLE'S SMART WATCH PLATFORM A LOT EASIER TO USE THAN PREVIOUSLY. RATHER THAN MIXING VOICE COMMANDS, TASKS AND SETTINGS INTO A SINGLE MENU — AND HIDING THE APPS BEHIND THE 'START' OPTION — THE USER INTERFACE HAS BEEN SPLIT INTO THREE SECTIONS: APPS, MOST RECENT AND FAVOURITE CONTACTS, AND VOICE COMMANDS.

01 The first step is updating your smartwatch to the latest version of Android Wear. Tap on the smartwatch face to bring up the menu, scroll down to 'Settings > About > System updates' to initiate the process. Your smartwatch will use your smartphone's internet connection to pull the update down, and once it's ready, you can tap to open the installer.



02 Being able to swap between watchface designs to suit your mood or fashion sense is half the fun of having a smartwatch. Each Android Wear smartwatch ships with a selection of watchfaces out of the box, and you can access these directly from the watch by pressing and holding on the screen until you feel it vibrate, and scrolling horizontally to find a design you like.

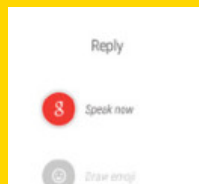
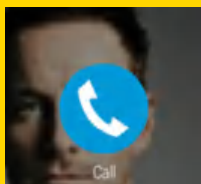
03 If you don't like the included watchfaces, you can download dozens more through the App Store. Open the Android Wear app on your smartphone, tap on the 'More' button next to Watch faces at the top, and scroll to the bottom to see the 'Get more watch faces' button to launch the watch face section on the Google Play store. You can also create your own



watchface by tapping on the 'My design' watchface and then tapping again on the settings icon.

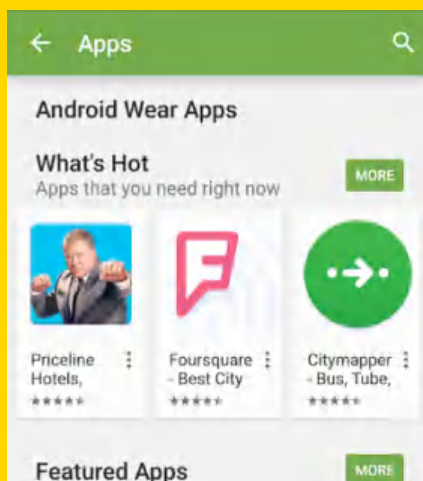
04 The notifications that appear on your smartwatch mirror the ones that appear on your smartphone. If you want to prevent certain apps from sending notifications to your smartwatch, go to the settings icon in the top right on Android Wear and tap on Block app notifications. From here, add the apps you don't want notifications from.

05 By default, the latest notifications will appear as a card on the bottom of your screen. To open the notification, swipe up from the card and then swipe left to see the full notification. Keep swiping left to see the options you have of dealing with it.

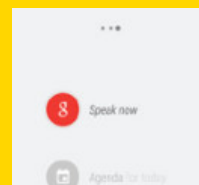


06 One of the options for messages and emails is 'Reply'. This lets you use your voice to dictate a message. You can also draw an emoji or pick from a selection of canned phrases.

07 Like notifications, apps on your Android Wear smartwatch are mirrored from your



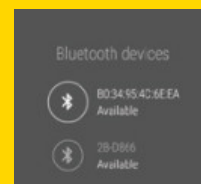
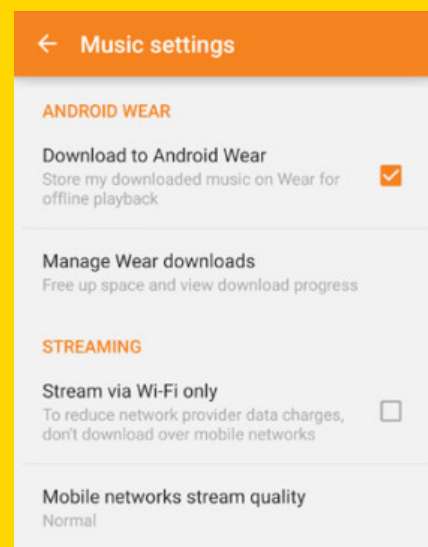
smartphone. In other words, if there are matching smartwatch apps for anything installed on your phone, they will automatically be installed. You may, however, decide to install apps on your smartphone specifically because it has a handy smartwatch equivalent. You can find good apps to install by going to Android Wear and tapping on the 'More' button next to Essential watch apps.



08 Google Now Voice commands enable you to do a variety of tasks simply by stating them in plain English. While the smartwatch is active, say 'OK Google',

and you'll be able to do everything from asking about the weather and checking when your next meeting is to asking for directions to the nearest Chinese restaurant and calling your mum.

09 Android Wear 4.4.2 added support for playing music directly off your smartwatch. To set this up, make sure you have the latest version of Play Music on your smartphone by going into the Play Store, switching to the My Apps tab, and tapping 'Update all'. Next, go to the Play Music app on your smartphone, go to Settings and tick the 'Download to Android Wear' box.



10 If you have music purchased outside of Play Music, you may need to upload them to the Play Music service and download them back to your device

for this to work. Once the music has transferred, pair Bluetooth headphones to your smartwatch for smartphone-free music playback. To do this, put your Bluetooth headphones into discoverable mode, then go to 'Settings > Bluetooth devices' on your smartwatch, find the name of your headphones in the list, and complete the pairing process.



Samsung Gear S

FAILS TO LIVE UP TO POTENTIAL.

THE MASSIVE POTENTIAL of the Gear S is enough to make any geek salivate. The plus-sized 2-inch curved display is just large enough to read entire emails and webpages on, and the built-in nano-SIM card port (the only smartwatch that currently offers this) means you can make calls, send text messages and tap into 3G mobile data without having to rely on a connected smartphone.

We say geeks, because the Gear S is simply too chunky for 'regular' folk. It really does look like you've got a smartphone strapped to your wrist, and while it has all of the trappings of its larger cousin — including 3G, Wi-Fi, GPS, Bluetooth, microphone, speaker, and vivid AMOLED touchscreen — it's curiously dependent on a compatible Samsung smartphone to operate.

You'll need a Samsung device running Android 4.3 or higher to set it up initially, as well as load any apps. While you can use the calls and SMS functionality off an installed nano-SIM card, sending and receiving email only works when it's connected to your smartphone over Bluetooth. The calendar is similarly crippled, only letting you view events but not edit them from the Gear S.

It's worth noting that the Gear S runs the Linux-based Tizen operating system rather than the common Android Wear, and as a result, it misses out on the excellent Google Now functionality and large selection of apps. There are a few good names on board, such as the Opera web browser, Nike+ Running, and TripIt, but most are paid apps of questionable quality by unknown developers.



Sony SmartWatch 3 Stainless Steel

THIS STEEL SMARTWATCH IS A STEAL.

THE STAINLESS STEEL variant of the SmartWatch 3 is Sony's first stab at the premium end of the market. The materials aren't quite as up-market as the equivalent Apple Watch, but for less than a third of the cost, it's pretty good value for money nevertheless.

The steel bracelet comes with all of the links attached, and unless you have mammoth-sized wrists, you'll need to get a few of them removed. Since these links aren't user-replaceable (unlike the Apple Watch's steel band), your first port of call is getting the watch professionally fitted.

Aside from the stainless steel enclosure, this model is identical to the regular SmartWatch 3, which is a hundred bucks cheaper. The 1.6-inch 320 x 320 square screen is joined by built-in GPS (the only Android Wear smartwatch to offer this), a 420mAh battery and Wi-Fi and NFC.

The display uses the older transreflective technology, and while it's bright and offers excellent outdoor visibility, the colours are dull compared to OLED, and the whites have a noticeable yellow tinge.

Sony has also swapped out the traditional optical heart rate monitor for built-in GPS, but the latter isn't as useful as it could be. It doesn't work with the smartwatch's Google Maps app (this only works with the smartphone's GPS chip), and we could only find three apps that made use of it.

The 420mAh battery will give you up to two full days of use, and we like the fact that it uses a standard micro-USB connector for charging (although the positioning of the port means only an L-shaped port will fit nicely).



SAMSUNG GEAR S

\$449
www.samsung.com/au

CRITICAL SPECS

66g, 2-inch 320 x 480 AMOLED display, 300mAh battery, IP67 rating, Tizen OS, 1.2GHz dual-core processor, 512MB of RAM, 4GB of storage, 3G, Wi-Fi, Bluetooth, optical heart-rate monitor, GPS, ambient light sensor.



SONY SMARTWATCH 3 STAINLESS STEEL

\$399
www.sony.com.au

CRITICAL SPECS

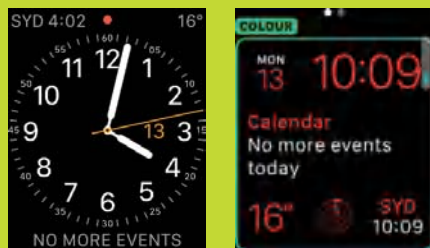
45g, 1.6-inch 320 x 320 transreflective LCD display, 420mAh battery, IP58 rating, Android Wear, 1.2GHz dual-core processor, 512MB of RAM, 4GB of storage, Wi-Fi, Bluetooth, GPS.



Be an Apple watchOS expert

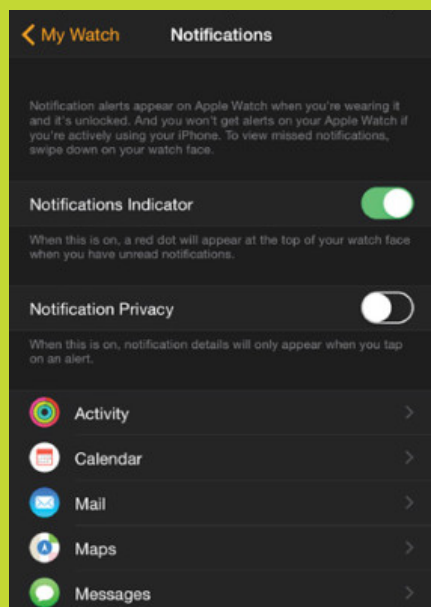
THIS WILL COME AS A SURPRISE TO DIE-HARD APPLE USERS, BUT THE NEW WATCHOS PLATFORM ISN'T NEARLY AS INTUITIVE AS THE LARGER-SCREENED IOS. THE CHALLENGES OF A SMALLER TOUCHSCREEN MEANS APPLE HAS HAD TO MAKE USE OF A VARIETY OF NEW INPUT MECHANISMS AND SCREEN TYPES, AND THIS PRESENTS A FAIRLY STEEP LEARNING CURVE. HERE ARE NINE STEPS FOR MASTERING WATCHOS QUICKLY.

01 The Apple Watch's watchface is the closest thing you'll come to a 'homescreen'. You can get here from any other screen by clicking the digital crown. From the watchface, swipe down from the top to see unread notifications, swipe up from the bottom to see your 'Glances' (more on that in step 6), press the digital crown to move to the apps launcher.



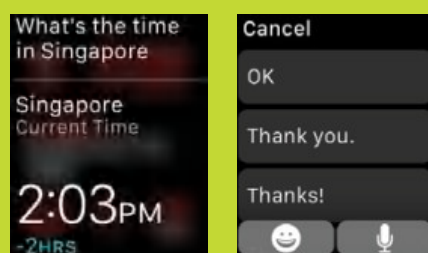
02 To change the watchface that's currently in use, do a deep tap (ie press and hold on the screen until you feel it vibrate) to scroll through the options. Some of the watchfaces can be customised when you tap the 'customise' button. Use the digital crown to scroll through the different options.

03 One thing that the watchOS does better than other smartwatch platforms is customising notifications. Instead of parroting back the notifications



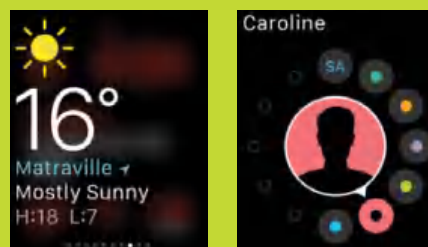
that appear on your iPhone, you can specify which email addresses and apps you want to see alerts for through the Apple Watch app. This saves on battery life, and also reduces the amount of time you spend looking at your watch like you're running late for something.

04 Siri works much like it does on your iPhone, letting you set reminders, alarms and meetings, navigate to particular places, launch apps, make calls, play music and find the answers to basic questions. To launch Siri, press and hold the digital crown or hold the Apple Watch up to your wrist, wait for the screen to come alive, and say 'Hey Siri'.



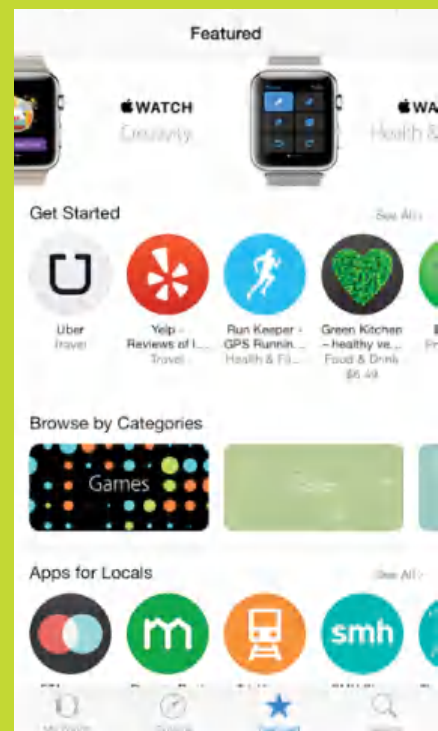
05 You can also take advantage of voice dictation to reply to text messages (but not emails). To do this, open the text message, scroll to the bottom to reveal the 'Reply' button, and tap the microphone icon to use the voice dictation. You also have the option of replying with canned phrases and emoji. Each emoji type has multiple options that are revealed when you scroll with the digital crown.

06 The Glances feature, accessible from the watchface by swiping up from the bottom, is similar to the widgets in iOS's Today pull-down shade. It gives you access to a subset of features or information from the installed apps on your iPhone, such as music playback controls, battery power remaining, your next meeting and the weather. You can customise what appears here and in what order from the Glances settings in the Apple Watch app.

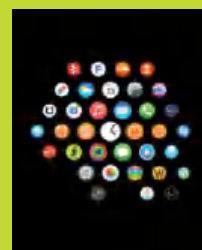


07 The 'Friends' screen, accessed by pressing the side button, is unique to the Apple Watch, giving you easy access to up to 12 of the favourites that you've specified in your iPhone's Phone app (you can edit this list from the Apple Watch app). Tapping on any of the entries gives you buttons to call or send them a text message — both of which you can do directly from the Apple Watch.

08 Like Android Wear, Apple Watch 'cross-loads' any watchOS apps that match the ones that are



installed on your iPhone. You can check out more watchOS apps that you may want to install by opening the Apple Watch on your iPhone, and tapping on the 'Featured' tab. To install the app, hit the download button to add it to both your iPhone and Apple Watch. If the app doesn't appear on the latter, go to the settings for that app in the Apple Watch app and tap the 'Show App on Apple Watch' option.



09 Browse through the apps installed on your Apple Watch by pressing the digital crown button from the watchface. You can zoom in and out of the app icons using the digital crown.



[WICKED WEARABLES - FITNESS BANDS]

Banding together

THE WEARABLE MARKET IS EXPLODING, AS FITNESS BANDS BECOME MORE ACCESSIBLE THAN EVER BEFORE. HERE WE COMPARE THE BEST ON THE MARKET.

[NICK BROUGHALL]

USING TECHNOLOGY TO help you hit your health goals has never been easier. With the massive explosion of both smart watches and fitness bands over the past 18 months, there's a real smorgasbord of options for using technology to take your fitness to the next level.

Depending on your goals though, there is a real difference between the benefits of a 24/7 fitness tracker and a smartwatch. While a smartwatch tries to do everything, the fact it has a large screen and a limited battery life means that it generally doesn't work all that well for tracking your overall health.

Sleep tracking, for example, is something that is woefully under-delivered by most of the smartwatches on the market.

But the 24/7 fitness trackers try to address that issue by minimising the display and making your smartphone the arbiter of relevant data. This side of the fitness equation is quite often overlooked by potential customers — it's important to look not just at the wristband's spec sheet, but also the software you use to read that data on your smartphone.

For the most part, the hardware you buy will be tied to that same company's app, although some platforms offer APIs that allow you to leverage your wristband's data via a new app.

Fitness bands are also getting smarter with each generation, introducing features like heart rate sensors and bio-impedance trackers, to try and gather more and more useful information to help you get healthy and stay that way.

But what you actually do with that data is the more challenging aspect of owning a fitness band. And that part is entirely up to you.



Fitbit Charge HR

EXCELLENT HARDWARE MIXES WITH MERELY ADEQUATE SOFTWARE.

THE FITBIT PULSE fiasco of 2014 really put the fitness company on the back foot, when it had to recall its shiny new fitness tracker following some adverse skin reactions. But the company bounced back with the Charge and the Charge HR, which are arguably much better products.

The Charge HR is the focus here. For \$200, you get a complete 24/7 step tracker that not only tracks your steps and your sleep, but also flights of stairs you've ascended, calories burnt and your heartrate, and about 5 days worth of battery life.

Unlike Jawbone's UP3 though, the Fitbit is always recording your heartrate. Those LED lights on the back are always flashing, so rather than just getting a single measurement when you wake up, you can track how your heartrate moved throughout the day. Want to know if that morning coffee makes your heart pump a bit faster? You can check using the Fitbit app.

The Charge HR has a small OLED display that can show you the time, steps taken, distance travelled, calories burnt, stairs climbed and your current heartrate. A small button on the side cycles through each mode — and the screen will also show you incoming phone numbers when paired to your phone.

The Fitbit app is great for delivering data, although actually making sense of it is a bit of a struggle. There are, however, integrations with other apps, including IFTTT, so you can use the Fitbit to help you get on top of your fitness goals.

08

FITNESS BANDS

HOW WE TESTED

We strapped each fitness band to our wrist and pumped a playlist of 80s training montage songs to our headphones. Then we walked, slept, ran and lived with each band, stopping only to charge the ones that needed it. We compared each band's tracking performance and app's ability to translate data into something useful while taking into account compatible apps.

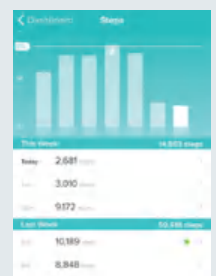


FITBIT CHARGE HR

\$200
www.fitbit.com

CRITICAL SPECS

Bluetooth 4.0; Heart rate monitor; Tri-axis accelerometer; Altimeter; OLED display; two size options.





Xiaomi Mi Band Smart

SO INEXPENSIVE, YOU WON'T CARE IF IT BREAKS.

THIS DIMINUTIVE BAND from China probably wouldn't be your first choice for a fitness band aside from one key feature — you can pick one up for under \$30. No, that's not a typo. Less than a quarter of the price of the next cheapest band in the test will get you a surprisingly robust and versatile tracker.

You will need to give Xiaomi your phone number to set the Mi Band up, which admittedly feels a little weird, but beyond that setting up is simple. The device itself is a small dongle in a rubberised bracelet. The dongle itself has no buttons and no touch sensitivity, so all engagement comes through the app and the three small LED lights on the front.

Those three lights tell you how you're progressing on your fitness goals, as well as how the battery is performing. You'll get almost a full month from the battery too, which is amazing for a tracker at this price. Getting those lights to light up can be a challenge, but it's forgiven at the price, really.

There's no real external app API — you just get your standard step and sleep tracking (it automatically detects your dozes), as well as call notifications (via a nice buzzing on your wrist) and a silent alarm to wake you up.

The Mi Band feels about as accurate as most of the other bands on test too, although you don't get calories burnt or any calorie intake options in the app.

It's not as fully featured as the rest of the bands on test, but it does deliver solid performance at an amazing price.

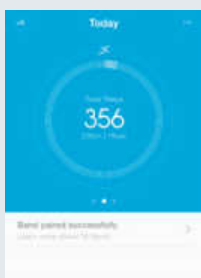


XIAOMI MI BAND SMART

\$30
www.mi.com/en/miband/

CRITICAL SPECS

Bluetooth 4.0; Tri-axis accelerometer; 30 day battery life; IP67 water resistance.



Fitbit Surge

LOTS OF VERSATILITY, BUT WITH A HIGHER-PRICE TO MATCH.

WITH ITS LARGER display that constantly tells the time, you might mistake the Fitbit Surge for a smartwatch. But no, Fitbit wants this particular device firmly placed in the fitness tracker department as a premium device.

This sees the larger screen, which can display real time workout data, as well as an integrated GPS sensor for tracking fitness activities much more closely. There's also the same heart rate monitor as the Fitbit Charge HR, meaning it constantly records your heart rate to help you get the most from your workouts.

Naturally, these extra sensors can record you running or walking, but there's also activity modes for weights, elliptical, spinning, yoga, workout, stair climber, circuit training, bootcamp, kickboxing, tennis golf, and even martial arts.

The GPS isn't the most accurate — Garmin's range of GPS sports watches probably have the edge on Fitbit's offering — but the versatility is great for active people wanting to take their fitness up a notch.

The design of the Surge does seem a little dated. The bezel on the screen and the monochrome LCD don't really compare with the displays on the likes of the Apple Watch. But the design is still functional. The Surge can also display incoming messages and phone calls, as well as control your music remotely if it's paired to your smartphone properly. It's easy to start and stop a workout, and cycling through your data on the touchscreen is simple. Plus, the Fitbit app is in its element here, as the more discerning user can take advantage of all that data being recorded in the app.

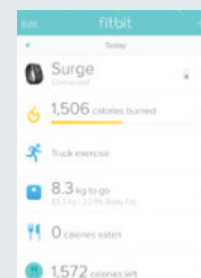


FITBIT SURGE

\$350
www.fitbit.com

CRITICAL SPECS

Bluetooth 4.0; heart rate monitor; Tri-axis accelerometer; Tri-axis gyroscope; Altimeter; Monochrome touchscreen LCD display; backlight.





Garmin Vivofit 2

EPIC BATTERY LIFE, BUT USING DATA IS TRICKIER.

THE FIRST VIVOFIT product from Garmin delivered two key features: year-long battery life and a personalised step goal. Beyond those two ideas though, the band was a bit of a disaster.

The Vivofit 2 addresses almost all of the criticisms aimed at the first generation. It maintains the same year-long battery, and adds a backlight for the display, as well as making it waterproof to 50 metres.

From a user interface perspective, there's still a long way to go. The same one-button interface controls the Vivosmart 2 with a variety of different button presses switching between different modes. It takes a while to get used to, but at least the addition of a backlight means you can see when you've popped it into sleep mode at night.

The band is also awkward to attach, but admittedly does feel more secure than all others on test.

One area that still needs a fair amount of work is the Garmin Connect app. It does everything it says on the tin, but the interface is sterile and not very useful — the sleep tracking, for example, just tells you how much you moved overnight, as though they forgot to add the algorithm that measures sleep quality.

The Vivofit 2 will sync with MyFitnessPal, but there's no other API for integration with other fitness apps, which places it at a real disadvantage to Fitbit and Jawbone.

But there's something really rewarding about the Vivofit 2. With a better app, this combination of year-long battery and water resilience could be a real winner.



Jawbone UP2

NOT THE FOLLOW-UP TO THE UP24 WE WERE HOPING FOR.

THE UP24 HAS long been a favourite fitness tracker here at *TechLife*, despite its tendency to physically break down within a year. So it made sense that Jawbone would take the inside bits that made the UP24 great and stick them in the more secure body of the UP3.

This is both a good and a bad thing. On the upside, the UP2 is significantly more secure on the wrist, despite its somewhat awkward clasp. It's much less likely to get caught on clothing or furniture as well.

But it also means that the problematic touchscreen and unreliable pairing issues that plague the UP3 are present too. The loss of a physical button means switching between active and sleep modes on the UP2 requires users to double tap the touch interface to wake it up, then hold it down to switch modes — which is fine when it wakes up first go, which it rarely does.

The stopwatch feature has also been buried in the app, which makes it a bit of challenge to activate. On the upside, Jawbone's app is still the best in terms of translating that raw data into useful information, giving practical challenges to improve your health and regular updates on your progress.

But perhaps the most frustrating feature of the UP2 is its proprietary charging cable, which is both too short and awkward to fit, and is significantly slower than last year's UP24 to charge, despite offering up to 10 days battery life.

It's cheaper pricetag makes it a better option than the UP3, but it still feels like a step back from the UP24.

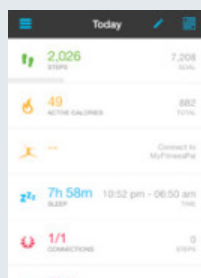


GARMIN VIVOFIT 2

\$139
www.garmin.com.au

CRITICAL SPECS

Bluetooth 4.0; Tri-axis accelerometer; 25.5 mm x 10 mm segmented LCD display; backlight; 1+ year battery life; 5 ATM water resistance (50m).

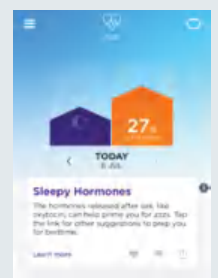


JAWBONE UP2

\$149
www.jawbone.com

CRITICAL SPECS

Bluetooth 4.0; Tri-axis accelerometer; 38 mAh battery; 220mm x 11.5mm x 3.0-8.5mm; 25g





Jawbone UP3

A BAND THAT FEELS LIKE IT'S WAITING FOR ITS APP TO CATCH UP.

WHEN IT WAS first announced, the UP3 was supposed to be a very different device than the one that actually ended up being released. Unfortunately, the pressures of mass production meant that the promises of a completely waterproof device capable of tracking your swimming weren't delivered. What we did get though is a pretty ingenious device that manages to cram a massive amount of sensors into a diminutive body that looks more like a fashion strap than a fitness tracker.

Alongside the traditional accelerometer for step tracking, there's also an optical heart rate monitor, thermometers for skin and ambient temperatures, and bioimpedance sensors for things like measuring galvanic skin response and respiration.

Coupled with about five days battery life, that all sounds impressive (and it is), but the problem is that so far, there's not a lot of useful information coming from those new sensors. The UP app is still the best out there for converting your metrics into practical information to help you achieve your goals, but at the time of writing, the only extra data points from those extra sensors are resting heart rate and a measure of REM sleep, neither of which are overly practical.

What's more, the change in design from the UP24 to a touch sensitive interface makes switching modes far less responsive. You also need to activate the stopwatch mode from within the app. But more frustrating is that the device will frequently disconnect from the app and not sync by itself, especially with the (limited) supported Android app. For the price tag, there's just not enough benefit in the current release of the UP3 to justify it over some of the other devices on test.

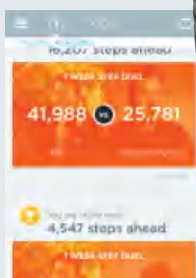


JAWBONE UP3

\$249
www.jawbone.com

CRITICAL SPECS

Bluetooth 4.0; heart rate monitor; Tri-axis accelerometer; Bio-impedance sensors; skin and ambient temperature; 220mm x 12.2mm x 3.0mm-9.3mm; 29g.



[BUYER'S GUIDE]
FITNESS TRACKERS
WHAT TO CONSIDER BEFORE YOU BUY A FITNESS TRACKER.

SOCIAL INTEGRATION

It's easier to stay committed when training with friends. Having friends using the same platform will definitely help you remain focused.

BATTERY LIFE

Some trackers need a charge every few days. Others can last up to a full year. Having a longer battery life generally involves a feature sacrifice though.

PRICE

Some trackers can be purchased for under \$50 now. Determine what you need from your device before deciding how much you want to spend.

SIZE

While many bands come with a one-size-fits-all wristband, others will require you measure your wrist before purchasing to get the right fit.

APP

The software is where you'll get all your exercise and sleep insights, so checking out what you like before buying is a good idea.

HEART RATE MONITOR

Different devices have different levels of measuring heart rate, so understanding what you want from a HR tracker will help dictate your decision.

WATERPROOF/RESISTANT

Technology and water rarely mix, so for a device that's going to get covered in your sweat, you'll want to ensure it's water resistant at a minimum.

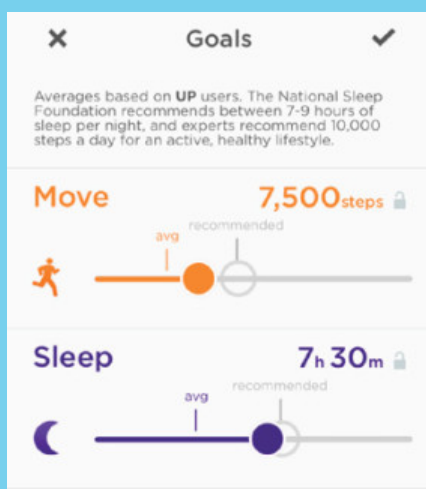
BAROMETER/STAIR COUNTER

Walking up stairs will help you burn those calories faster, and tracking that information can help inspire you to do it more often.



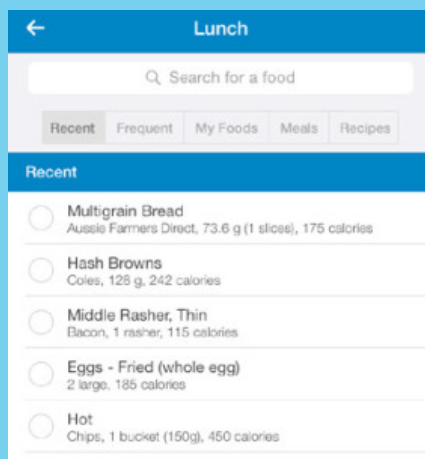
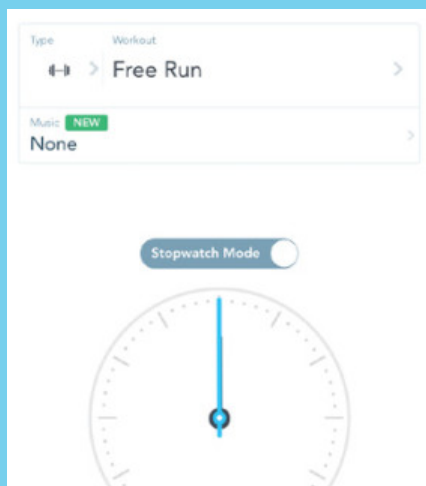
Tricks for effective fitness tracking

NOW THAT THERE'S A SHINY NEW FITNESS BAND WRAPPED AROUND YOUR WRIST, IT'S TIME TO ACTUALLY USE IT. CHANCES ARE YOU INVESTED IN THIS LITTLE STRAP IN AN ATTEMPT TO FIND MOTIVATION TO LEAD A HEALTHIER LIFESTYLE, SO WE'VE DECIDED TO COLLABORATE A HANDFUL OF TIPS YOU SHOULD DEFINITELY TAKE INTO ACCOUNT IN ORDER TO GET THE MOST OUT OF YOUR WRIST-BASED FITNESS GADGET.



01 SET REALISTIC GOALS

Almost across the board, the default step goal for these fitness bands is 10,000 steps. On average, most people only take about 5,000 steps a day. Now while having the goal of doubling your activity is commendable, sometimes setting a smaller, more attainable goal is a smarter way to kick things off. You can always up the step goal once you're regularly hitting your stride. To get you started, why not set your goal at 7,000 steps and go from there. As a side note, this strategy also works for trying to get more sleep — set a more achievable goal of seven hours, and try



and work your way up to eight hours a night over a month or two.

02 KEEP TABS ON YOUR FOOD INTAKE

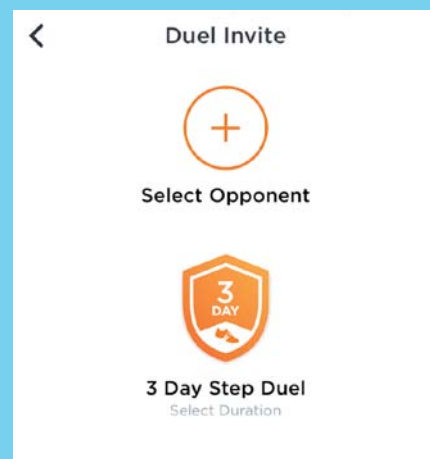
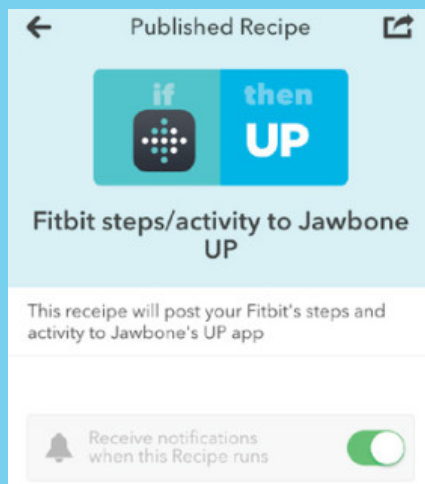
If losing weight is your long-term goal here, keeping tabs on what goes in your mouth is as important as the amount of calories you burn off. Many of the leading fitness band apps have their own food tracking components, but as a general rule you'll be much better off using a third-party app like MyFitnessPal to keep tabs of your food consumption. It has a much more reliable database than the app your fitness band uses (especially in Australia) and it syncs nicely with most apps too.

03 GIVE THE GIFT OF IFTTT

Popular web automation platform IFTTT works with Fitbit, Jawbone, Sony, Nike+, Withings and Misfit devices, so if you're using one of those, you should definitely take advantage of this underrated service. You can use it to do everything from Tweet your celebration dance when you hit your step goal, through to using it to remotely turn on your coffee machine or lights (with a compatible WeMo power plug, that is). The possibilities are endless, and you don't even need any creativity to get started — simply browse through other people's recipes for your channel and select which ones you want.

04 TRACK YOUR ACTIVITIES

Not every step taken is equal. The amount of energy you use walking to the toilet is not the same as what you require taking an hour long hike. While many fitness trackers will automatically detect when you do something a little more strenuous than cross the road



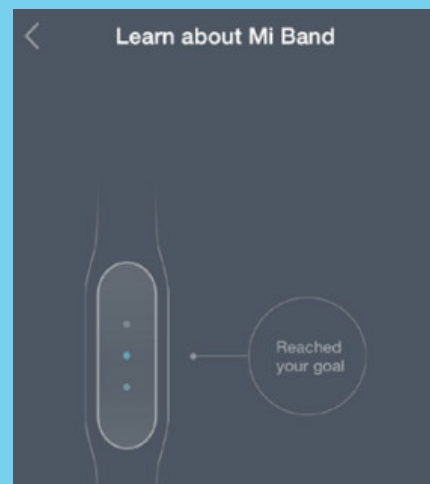
for a coffee, it's still worth taking the time to actively recognise when you do go for a proper workout. On many devices, you can just use the stopwatch function to record this data, but a better way is to use a third party app that syncs in with your band's app. Strava, Runkeeper and MapMyFitness are all good places to start, and offer the benefit of using your smartphone's GPS for even more data on your performance.

05 WORK WITH A FRIEND

There are scientific studies showing that people are more likely to stick to an exercise regime if they do it with a friend. So it's definitely worth bringing that across to your fitness band. Try and make sure that you have like-minded friends using the same brand of band as you, and then take advantage of the competitive elements of your band's app. Challenge your friends to duels, initiate challenges and treat your step counting as the competitive game against friends that it is destined to be. As soon as a challenge is finished, start a new one so that you are always competing for step-glory.

06 KEEP IT ON YOUR WRIST

This one goes without saying, but remember that you're only going to be counting steps when you're actually wearing your new fitness band. Those precious steps taking you from your bed to the shower each morning should be counted towards your overall total for the day, so go out of your way to make sure they are. All of these bands are designed to be worn 24/7, and while not everyone is interested in keeping tabs on their sleep, ensuring you don't miss out on the steps from your midnight snack run goes a long way to ensuring you get the most out of your fitness purchase.





Misfit Shine

WATERPROOF AND WITH GREAT BATTERY LIFE, BUT ARBITRARY.

AT ITS CORE, the Misfit Shine wants to be a piece of jewellery that happens to track your fitness activities. And because jewellery is infinitely personal, the Shine stands out from the competition in that it can be worn almost anywhere on the body, given the right attachment.

This comes down to the Shine's small, shiny, stone-like design. The circular face features 12 small LED lights, which activate upon tapping to both illustrate your day's activity progress, as well as tell the time (although it takes a while to learn how to read it).

That tiny footprint is powered by a single watch battery, that lasts about four months before you need to replace it. The longevity of the battery is certainly part of the Misfit's winning charms, but it is held back by a few inconsistencies with the software.

The Misfit uses an arbitrary points system to track your activity, as opposed to just tracking the number of steps you take. Part of this is probably due to the fact the Shine can track your swimming, though.

The app will still give you steps, distance travelled and calories burnt, but the fact that it uses a unique measurement (that means nothing) doesn't help you strive to achieve your goals.

Sleep is also tracked automatically, and looks reasonably accurate, even if it did fail to detect when we got up in the middle of the night as an "awake" time. Syncing is a little sporadic and slow too.

With IFTTT integration recently added, there's a good range of versatility here. But it does feel like there's a little too much fashion and not quite enough function.

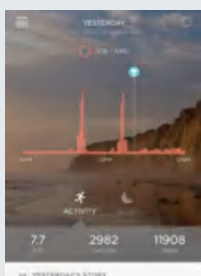


MISFIT SHINE

\$130
www.misfit.com

CRITICAL SPECS

Bluetooth 4.0; Tri-axis accelerometer; anodized aluminium, up to 6 month battery life; 50m waterproof.



Sony Smartband Talk

AN E-INK, ANDROID-ONLY BAND THAT DOESN'T DELIVER ON BATTERY.

IT'S ALMOST SURPRISING that it took as long as it did for someone to stick an e-ink display into a fitness tracker. Considering e-ink only sucks down the battery life when it changes the display, you would think that it would be a natural fit for this type of wearable.

Unfortunately for Sony, while the e-ink screen is a great display for checking in full sunlight, it's not the battery sipping technology you might hope for. The Smartband Talk only gets you about three days worth of tracking before you need to plug it back in, which is terrible performance given the pricetag.

The small flap over the USB charging port that gives the Smartband Talk its IP68 water rating doesn't feel that secure, although Sony argues you shouldn't take the device swimming anyway.

The interface is controlled by a volume rocker and a button on the side, while "touch" controls are activated by tapping the screen. The Talk can pair with your smartphone to make and receive calls, although you'll probably never use that function.

Sony's Lifelog app is Android only, and has the interesting approach of tracking not just your steps and sleep, but also time playing games on your phone, listening to music, taking photos and more. It also pairs with IFTTT and offers some decent insights into your habits.

But ultimately that battery life is a massive disappointment, and Sony's Android-only approach limits the potential audience, especially given some features are further restricted to Xperia handsets.

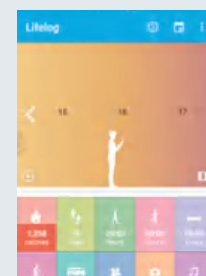


SONY SMARTBAND TALK

\$199
www.sony.com.au

CRITICAL SPECS

Bluetooth 4.0; Tri-axis accelerometer; Altimeter; 1.4-inch e-ink display; 3 day battery life; IP68 water resistance; Microphone and speaker.



[WICKED WEARABLES - EXERCISE HEADPHONES]

Sports-proof Bluetooth headphones

CUT THE WIRES AND TURN UP THE SOUND – AND IMPROVE YOUR FITNESS – WITH THESE BLUETOOTH BEAUTIES.

[PAUL TAYLOR]

WEARABLE DEVICES SUCH as the Fitbit and Jawbone's UP are excellent at tracking exercise routines and how often wearers get themselves moving, but for many people actually doing the exercise often requires something to get them in — and staying in — the mood. Scientific studies have shown that music has a stack of benefits, not least decreasing your perception of how much effort you're putting in while increasing your levels of concentration, leaving you feeling much more positive than without music playing, and stimulating your brain at the same time.

A lot of wireless headphones, especially ones with a focus on fitness, have both tips (the bit that goes into your ear canal) and a structure to keep them firmly wedged around your ears — either 'wings' or stabilisers that fit into the curve of your ear, or a loop that goes in between your ear and skull. Those earphones that have both tips and wings usually make them in two separate parts so they can be customised. Maybe you have large canals but a small ear. No problem, there's often three sizes of both tips and wings included.

Although wireless headphones will untether you from your smartphone, you'll still have to carry it around. All the headphones here are paired via Bluetooth, and have a wire that connects each earbud to the other. All are recharged via micro USB.



Jabra Sport Pulse

COMFY, SMART AND WELL MADE.

JABRA'S LINE OF sports headphones may have a newer, younger (albeit nearly identical) model in the Coach, but the Pulse remains the champion of the two, and it's one of the most intelligent fitness wearables going. Where the other headphones in this roundup simply play music, Jabra's acts as a personal coach, one that tells you what exercises you should be doing and how you're performing — and the discreet (and brilliant) heart rate monitor is ideal for fine information. While the Pulse shifts your attention and complete reliance away from your smartphone's screen and into your ear, you'll need your phone while you're working out, as the accompanying app stores all the info and relays important information to you. It's been designed with runners, walkers and cyclists in mind, spitting out stats on your cadence, pace, split times and so on, but if you prefer the gym with its weights, or want to do body-weight exercises instead, you can build a customised routine of exercises from a list of 54. Create a list, hit 'start', and the friendly-sounding voice reads out what you need to do. What's also impressive is the tip and wing system — these offered the most secure fit in this group test, and the sound quality was also commendable.

Jabra Sport Coach

NEWER BUT NO BETTER.

WHAT SEEMS LIKE a distinct new product is, in practice, a strange side step. Where the Sport Pulse has a heart rate sensor, the Coach has a motion sensor that can be calibrated for indoor running, and will track your steps, cadence, distance and pace. It's useful if using your phone's GPS isn't an option. However, treadmills can cover off this info as standard. But, thanks to its rugged, sweatproof build it's made for use outside too. Like the Pulse, you can program your own workouts from the list of 50-plus exercises, and the accompanying app (that only works with the Jabra headsets) is brilliant. It's easy to use, has diagrams and instructions, and provides useful metrics. What seems short-sighted, though, is that the motion sensor won't work for free- or body-weight exercises (think deadlifts, squats, lunges, kettlebell swings). While you can plug in a roster of sets, it's up to you to manually trigger the next lot by tapping the button on the left earpiece — a feature that's also available on the older Sport. Like the Sport, the fit, build and sound quality is excellent (though it could be a little louder). It's hard, in that case, to recommend the Coach over the Sport, unless you do a lot of exercise, indoors, on machines that don't have displays.

07

EXERCISE HEADPHONES

HOW WE TESTED

Every set of headphones was taken on a 2km run as well as vigorous body weight training to check for comfort, and paired to a Sony Xperia Z1. For music, we used the Xperia in conjunction with Poweramp set with a neutral equaliser.



JABRA SPORT PULSE

\$178
mobileciti.com.au

CRITICAL SPECS

6mm drivers, 20Hz - 20kHz, Sensitivity 94dB, Bluetooth 4.0, NFC, IP55 rating, weight 16g, four pairs of wings, four pairs of tips, claimed battery life 5 hours, heart rate monitor, iPhone and Android apps, built-in mic.



JABRA SPORT COACH

\$199
jabra.com.au

CRITICAL SPECS

6mm drivers, 20Hz - 20kHz, Sensitivity 94dB, Bluetooth 4.0, NFC, IP55 rating, weight 16g, four pairs of wings, four pairs of tips, claimed battery life 5.5 hours, motion sensor, iPhone and Android apps, built-in mic.





Plantronics BackBeat FIT

STRANGE FIT, GOOD RESULTS.

MOST HEADPHONES, EVEN ones with a 'cradle' design like the BackBeats that loop over the back of your ear, use flexible silicon tips. Not so the FIT: instead, the eartips are funnel-shaped paddles. They're also very firm, so it can be a shock using these after something a bit more forgiving. It also meant in our test that it took a lot of fiddling to get them comfortable, and one side never felt like it was properly inserted, and no alternative 'funnels' were included. Despite initial concerns that the sweatproof tips were too hard to be good for long sessions, and that the sound would be lacking thanks to the slightly loose fit, we soon got used to them — and pleasingly we were greeted with rich bass, and solid mids and highs. The BackBeat's are also astoundingly simple to use as play/pause and volume controls live on the left bud, and calls on the right, with big buttons and raised notches. The reflective neckband can't be adjusted, though only Beetlejuice or King Kong will struggle with its length. And, you get plenty of battery life, with close to eight hours of music playback and two weeks of standby power. Points, too, for the included armband case which will fit all but the beefiest of smartphones.



PLANTRONICS BACKBEAT FIT

\$88.45
mobileciti.com.au

CRITICAL SPECS

13mm drivers, 50Hz - 20kHz, Sensitivity 105 dBspl/mW @1kHz, Bluetooth 3.0, IP57 rating, weight 24g, claimed battery life 8 hours, built-in mic.



Beats Powerbeats2 Wireless

LOADS OF SOUND WITH A PRICE TO MATCH.

THESE ARE THE headphones that have been endorsed by professional basketball player LeBron James, who's pictured on the packaging wearing a pair of Powerbeats. It's an important image, because his stature indicates why these otherwise simple headphones are about 10 percent more expensive than others in their class.

True, they have a sturdy IPX4 rating that'll get you through heavy rain, and they feel very solid. The design is also eye-catching, though the housing looks like it could've been slimmed down if it wasn't for the huge Beats logo that's splashed on the side.

Beats has opted for an earhook design that can be adjusted for a tight fit, and has included four sets of tips, including a double-flanged pair which is unique in this roundup. A cable management loop keeps the cord in order. Running low on power? No problem, a 15 minute quick charge will literally give you an hour of power. The sound is very direct, skewed toward the lower end but not washed out in bass like other Beats phones, and while these are by far the loudest headphones in our roundup the sound isn't particularly big, there's just lots of it.

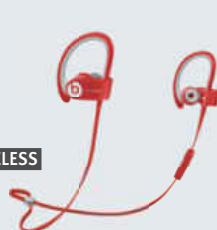


BEATS POWERBEATS2 WIRELESS

\$199.95
store.apple.com/au

CRITICAL SPECS

Weight 26.7g, claimed battery life 6 hours.



[BUYER'S GUIDE]
**BLUETOOTH
EARPHONES**
WHAT YOU NEED TO
CONSIDER BEFORE
YOU BUY A PAIR.

WATERPROOF RATING

Bodies of water affect bluetooth, but if you're planning on running in the rain (or perspire lots) then check this (usually an IP number, and the higher the better).

EASE OF FINDING BUTTONS

Inline controls offer the most recognisable layout, while buttons on the earbuds allow for a streamlined and equal distribution of weight.

BATTERY LIFE

Don't be too put off by low operational hours: unless you're an elite athlete it's unlikely you're exercising for six hours a day.

SILICON TIPS

Check for replacement tips so you have options to make headphones fit as well as they possibly can (also useful if you're prone to losing accessories).

WINGS/ STABILISERS

Strange at first, these add a lot of stability when the tips are in your ear and will prevent them falling out or shifting.

LOOPS

Usually implemented in place of stabilisers, these go over your ear, between it and your skull. Useful if you find stabilisers uncomfortable or invasive.

WEIGHT

Not as simple as the lighter the better. If the band is rigid and they fit well in your ear, more weight isn't a problem.

NFC

Great for Android owners, as it'll cut out one more step rather than having to potentially enter a passcode to pair to your phone. Using an iPhone? Sucked in.



Philips ActionFit Airborn SHQ7300

BASIC AND BORING.

PHILIPS' SPORTS HEADPHONES boast some impressive features. NFC (for Android, while Apple users will have to rely on manual pairing) and an IPX2 waterproof rating put it off to a good start. Otherwise, these are simple and reliable if a little uninspiring, and every pro has a con. The Action Fit's employ an ear-wing system that's secure, but the wings themselves are a little flimsy, so you'll need to make sure you have the right size tips to ensure a snug fit. When you do, you'll be greeted with plenty of bass at a trade off of lacking top end fidelity. The buds themselves are lightweight and when you have the right fit they're very comfy, but the cord that drapes around your neck is heavy. They make a fair bit of noise, but to avoid clipping when the volume is set as high as it will go, the 'phones will diminish some frequencies, which leads to the sound 'pulsing'. Do this, though, and you'll rinse through the battery life, which at best will last about five and a half hours. Considering the high RRP there are better options out there.



SportzBeatz Motion

CHEAP AND NOT SO CHEERFUL.

IF ALL YOU need is a set of sports-oriented bluetooth headphones at a knockdown price, look no further. Sweatproof, lightweight, and with a respectable six hours of battery life, the SportzBeatz Motion (different from the Motion Plus which we couldn't secure in time for this review) have a great range of wings and tips, plus ear hooks — it's a generous offering. We also appreciated that the wings were made to be cut for a custom fit, so you could reasonably expect to walk, run or cycle all day and still have these gripping on.

There are, however, a lot of compromises. The main problem is the sound quality, which is harsh across the spectrum; tolerable, but not overly enjoyable, with little warmth or clarity, despite this tester ensuring a snug fit with the included tips. They also feel cheap, hard plastics dominating the body of the buds that holds the circuitry for the buttons and the battery. Plus, the microphone was abysmal for phone calls, as our test calls were faint and scratchy. Best if you're on a budget and want wireless headphones for playback only.



JBL Synchros Reflect BT

COMFY BUT DORKY.

ANOTHER SIMPLE PAIR of sweatproof bluetooth headphones enter the fitness fray, and these have a prestigious red dot design award from 2014. The packaging bodes well but the final product is a fizzer. First, the good parts. JBL has manufactured the tips (the bit that goes in your ear canal) and the wings (the bit that wedges the unit into the curve of your ear) into one silicon lump, so there's less parts to lose. It also makes for a secure and simple fit which is appreciated. They're also the only other set of phones in this roundup that have a reflective strip along the cord — another nice touch if you like to run in low light — and the cord has an integrated cable management loop. Plus, a small magnet in each bud locks them together so they won't flap around your neck when they're not in your ears. Here comes the 'but': these are the dorkiest looking earbuds we've used. They're massive, and the size doesn't translate to big sound either as everything at the upper end is hollow. Best way to describe it is like listening to music with your ears blocked, or when they need to 'pop' after a change in air pressure. Despite frantic attempts to tame them on our music player's equaliser we can only say you're better off looking elsewhere.



PHILIPS ACTIONFIT AIRBORN SHQ7300

\$149
dicksmith.com.au

CRITICAL SPECS

6mm driver, 8Hz- 20kHz, Sensitivity 105dB, Bluetooth 3.0, NFC, IPX2 rating, weight 15g, three ear tip sizes, two stabilisers, claimed battery life 5.5 hours, built-in mic.



SPORTZBEATZ MOTION

\$69.98
dicksmith.com.au

CRITICAL SPECS

Bluetooth 2.1, weight 16g, three sets of tips, three sets of stabilisers, claimed battery life 6 hours, built-in mic.



JBL SYNCHROS REFLECT BT

\$179.95
jbhifi.com.au

CRITICAL SPECS

8.5mm drivers, 10Hz - 22kHz, Bluetooth 4.0, rated as sweatproof, weight 23g, three ear tip/combined stabiliser sizes, battery life 5 hours, built-in mic.



[WICKED WEARABLES - SPORTS]

Specialised sports wearables

WE TAKE A LOOK AT SOME OF THE MORE NICHE SPORTS WEARABLES AND TRACKERS TO SEE WHICH ONES STACK UP.

[JOEL BURGESS]

THE EXPLOSION OF wearables over the past couple of years has generated thousands of devices that are geared towards improving health, but for the most part these wearables have been designed for the general public rather than those who live and breathe their sport. But access to the types of simple information that wearables can deliver is potentially far more valuable to people that train on a regular basis, as it can be used to grasp the scientific side of physical activity and turn that into real results. And somewhat unsurprisingly, alongside that general wearable revolution, the sporting industry has also been working closely with technology and reaping the benefits of connected sensors. Whether it's measuring the length of your stride or how much spin you apply to your average backhand shot in tennis, the insights provided by a new breed of specialised training wearables are starting to trickle down into the consumer market — which is great news for non-professional athletes. Keeping on top of your game is a crucial aspect of competitive sport and some of these sport-specific wearables may just give you the edge you're looking for.



Sony Smart Tennis Sensor

AN EIGHT-GRAM TENNIS COACH.

THE FACT THAT Sony's Smart Tennis Sensor only works with compatible Wilson HEAD Prince and Yonix racquets means you'll have to be pretty serious about improving your game to justify forking out for both it and a new racquet. That said, the closed racquet ecosystem that Sony has cultivated with its Tennis Sensors does mean that, with the few racquets that are compatible, things work exceptionally well. The sensor attaches to the bottom of the racquet and connects via Bluetooth to a well designed and intuitive app on your Android or iOS smartphone. Apart from telling you how fast you hit each ball, the app also records swing speed and even how much spin you apply to the ball. All your shots aren't just lumped into one big data-set either: the app timestamps each shot and tags it in one of eight backhand or forehand categories, so you can break down which shots need improvement. You can also record the match using your smartphone camera and it'll sync the tennis shot data to the video so you can see shot details as they happen. Yes it's pricey, but if you can get past that then the rich data and ease-of-use of this wearable make it hard to fault.



SUPERGUIDE
SPECIALISED SPORTS WEARABLES



Garmin Approach S6

SLOW & STEADY DOESN'T ALWAYS WIN THE RACE.

BEFORE OPENING THE box, we were pretty excited about testing this golfing watch. With a colourful GPS display, reasonably pleasing shape, secure rubber wrist strap and nice overall design, the S6 was still 'under par' once we'd slapped it on our wrist. But first impressions aren't always accurate and the second we actually started using it, we realized it wasn't going to live up to initial expectations. The fundamental problem with the S6 was the same factor that made it seem enticing: the touchscreen display. Most touchscreens use capacitive tech which allows for better touch responsiveness, but Garmin has opted for a resistive touchscreen — presumably because it'll allow you to use it while wearing gloves. The downside is that navigating through menus can be surprisingly fiddly, and as annoying as that is generally, it becomes even more frustrating once you're actually using it on the golf course. Apart from this, the S6 does deliver useful info, from swing tempo to colourful course maps. It adds up to a nice balance between usefulness and presentation. There's a lot of potential here but we wonder if it might have been better to opt for more responsive button-based controls, rather than a somewhat laggy touchscreen.

07

SPORTS WEARABLES

HOW WE TESTED

Where compatible apps were required we used an iPhone 5 and a MacBook Pro. The Sony Smart Tennis Sensor was tested using a compatible Wilson Blade S86 tennis racquet. The golf watches were both tested at Palm Beach Golf Course. And the running wearables were all worn during a jogging session.



SONY SMART TENNIS SENSOR

\$249
sony.com.au

CRITICAL SPECS

Water and dust resistant, 2 hour charge time for 90 minutes continuous use (180 minutes without Bluetooth), app for Android 4.1+ and iOS 6.1+, 8g.



GARMIN APPROACH S6

\$499
garmin.com

CRITICAL SPECS

10 hour battery life in GPS mode, waterproof to 50m, 30,000 recognised international courses, Garmin Connect app for Android and iOS.





TomTom Golfer

FUTURISTIC CONTROL MODULE INCLUDED.

IN THEORY, THE metal body and glass screen of the low-profile TomTom Golfer watch makes it feel like a well designed premium offering that matches the quality offered by the notably more expensive Approach S6. But anyone that was genuinely enticed by these external design features are likely to be offput by the addition of a lopsided button-wheel extension-come-charging-dock that reduces the visual appeal and overall style considerably. The Golfer has a more modest repertoire of capabilities than the S6 and the black-and-white screen, lack of swing sensors and less-intricate interface make it clear why it's less expensive than the S6. That said, for the few things that it can do, the Golfer does them well. The button-wheel (actually a rounded square) makes sense once you start to use it, allowing quick and effective navigation to the information you want. With hazard distances, green layout and a scorecard, you get a lot of the same information as the S6, albeit in a more numerical, less visually-interesting way. The Golfer is a well rounded device, but it may not be quite appealing enough to entice less tech-savvy golfers.



Garmin Forerunner 225

A CHUNKY BUT WELL DESIGNED TRAINING DEVICE.

THIS DEDICATED RUNNING watch from Garmin is contained in the company's signature rounded-plastic watch design and is held on by a double pinned rubber wrist strap. The Forerunner 225 is one of only a handful of smartwatches that have an accurate heart rate monitor built directly into the watch. Not only does this mean that there's one less thing to worry about putting on before training, but the fact that there isn't a sacrifice in heart rate accuracy either makes it a solid attribute. Like other devices in the Garmin ecosystem, the Forerunner 225 pairs with the Garmin Connect app on smartphone or through a computer's web interface. The Connect app serves up the running watch's data in an informative but not overly-complicated way, so you can quickly see everything from how far you ran to your average speed, all pinned to a GPS map of the ground you covered. The watch has an easy-to-use interface and the capacity to store 200 hours of activity data and, all up, that makes it a solid option if you want improve your running training.

[BUYER'S GUIDE]

SPECIALISED SPORTS WEARABLES BUYER'S GUIDE

WHAT TO LOOK FOR WHEN BUYING A SPORT-SPECIFIC DEVICE.

BATTERY LIFE

Even the most sophisticated wearables will be useless without a respectable battery life and if it's something you're using every day, battery life can be a make or break feature.

FASTENING

There are many different types of sport wearables, but one thing they all need is a secure strap or clip that won't come off when you're training. Make sure you'll be happy with how — and where — they attach.

CONNECTIVITY

Most wearables will connect to a secondary device (such as a smartphone, watch or PC) that'll have the capacity to process and/or display captured data better. Find out exactly how a wearable connects before committing to a purchase.

WATER RESISTANCE

Some wearables will let you go diving in them, while others really shouldn't even be taken in the shower. Knowing which one yours is might just save you from an expensive mistake.

RACQUET COMPATIBILITY

If you're buying a tennis sensor, make sure you can install it into the racquet you want — some devices won't work without an approved racquet.

TOUCHSCREEN TYPE

This is especially important for sports gear like golfing watches. Because some golfers use gloves, the resistive touchscreens in golf watches can make navigation less responsive.

FULL DETAILS

Many running wearables will offer both smartphone apps and online options for sifting through sport data, if you want all the gory details computer apps are generally better.

INBUILT HEART RATE MONITOR

Some running watches come with an inbuilt heart rate monitor and others will have an accompanying Bluetooth-connected chest strap.



TOMTOM GOLFER

\$299
tomtom.com



CRITICAL SPECS

Up to 10 hours battery in GPS mode, 50m waterproof, 34,000 compatible international courses, TomTom MySports App Android and iOS.



GARMIN FORERUNNER 225

\$389
garmin.com



CRITICAL SPECS

Up to 10 hours battery in GPS mode, waterproof to 50m, 200 hours of activity storage space, Garmin Connect app for Android and iOS.



Garmin Foot Pod

A PEA SIZED POD.

APART FROM BEING incredibly light, the Garmin Foot Pod is also tiny and you'll barely realise you have it on once you've laced it into your shoe. Cadence (which in running is the pace at which you take steps) is a critical part of maximising the effort to stress economy in running training — and getting to what certain Olympic trainers consider the magic '180 steps per minute' can be a difficult task without the help of a little technology like this device. Unfortunately, many of the foot pods available on the Australian market require a compatible smartwatch to use them and the Garmin Foot Pod is no different. Apart from displaying a timestamped graph of your average cadence (and where you dipped) over the course of your run, it also gives you an average stride length for each session. While the Foot Pod does exactly what it sets out to — and the size and price make it relatively appealing — that need for a Garmin watch to use it does increase the overall cost considerably.



Polar M400

WHEN TRAINING IS MORE LIKE A LIFESTYLE CHOICE.

THE POLAR M400 running watch has a power-dry rubber wristband, a solid metal body and a crisp red-and-black trimmed display, which all combine to give this specialised device a genuinely premium look and feel. But the M400 doesn't just look good: the software and connected applications display a plethora of information that will be useful to anyone looking to improve their running. It's worth noting that the overall training interface on the smartphone app is slightly oversimplified and isn't as intuitive as some of the other apps we've used. But fortunately the shortcomings of the smartphone app are nowhere to be found in the computer app and browser-based Polar Flow account. Here, all your training data is displayed in an impressive collection of graphs, maps and tables and there's enough raw data to keep even the most nitpicky runner satisfied. The M400 package includes a chest-strap heart-rate sensor, meaning there's one extra thing to wear, but that's the sacrifice for the more slimline watch design. All up, the Polar M400 is an excellent training companion, and with an appealing design to boot.



Polar Stride Sensor

TAKES RUNNING IN ITS STRIDE.

THE STRIDE SENSOR from Polar is a little more cumbersome than Garmin's mini Foot Pod, but despite the fact that it's physically about five times the size of the latter, we'll concede that it's still really not that big. Its solid-rubber detachable casing features a couple of vents to feed your shoelaces through and fix the brace securely to your foot. In terms of data, the Stride reports the same cadence average and maximums, and plots them on a visible graph alongside your heart rate and pace data, making it easy to see where your step-rate is falling and why. It also accurately reports your stride length for the session. Note that the Stride reports your cadence in individual foot cadence, rather than the 'total step' approach you get from Garmin, which will potentially make the data a bit more accurate, but it's probably of negligible impact in real terms. The Stride costs an extra \$10 over the Garmin, but in terms of benefits it doesn't perform any better or worse — and it also requires a Polar watch to use it — so it's hard to really recommend one over the other. The Stride is an accurate running cadence sensor overall and could be a useful little tool for improving your running.



GARMIN FOOT POD

\$99
garmin.com



CRITICAL SPECS

Water resistant, 400 hours battery, compatible with the Forerunner series and a number of other Garmin watches.



POLAR M400

\$349
polar.com



CRITICAL SPECS

Package includes heart rate monitor, up to 8 hours battery using GPS, water resistant, up to 30 hours of activity storage space, Polar Flow app for Android and iOS.



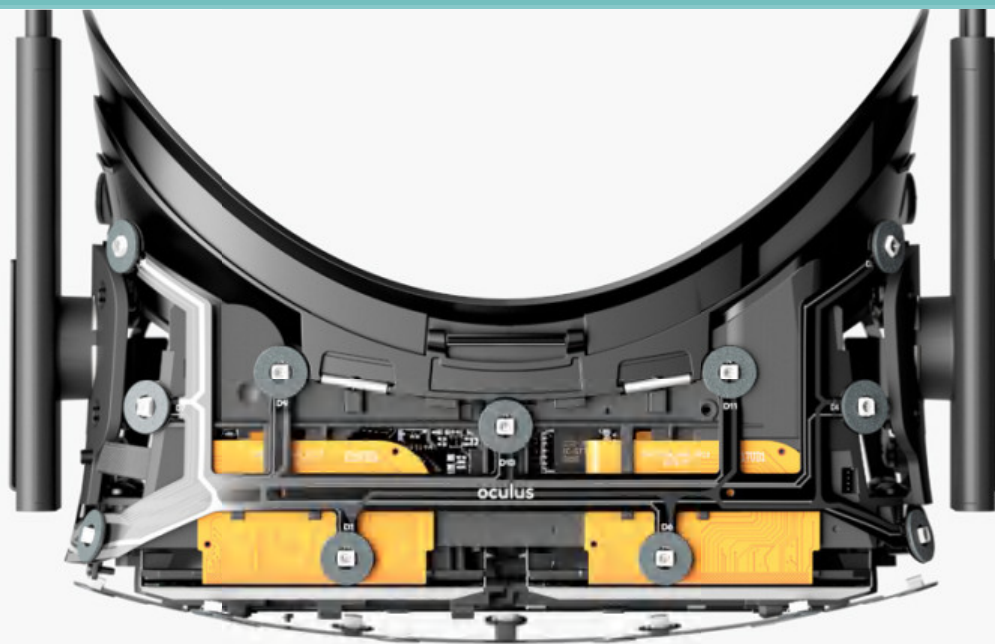
POLAR STRIDE SENSOR

\$109
polar.com



CRITICAL SPECS

600 hours of battery, water resistant, Compatible with Polar M400 and V800 watches.



[WICKED WEARABLES - VR HEADSETS]

Day one of the VRevolution

WE DON FOUR OF THE LATEST VIRTUAL REALITY HEADSETS TO SEE WHETHER THE IMMERSIVE TECH'S TIME HAS FINALLY COME.

[BENNETT RING]

ACCORDING TO SOME of the leading minds in the technology world, Virtual Reality is The Next Big Thing™. It's taken over twenty years for technology to catch up to the unfulfilled VR dreams of the early 90s, when bulbous, heavy headsets and wonky motion tracking delivered some of the most expensive vomit-inducing devices ever created. Thankfully leaps in display technology and motion sensing appear to have solved these issues, finally allowing VR to deliver comfortable experiences that see the user deeply immersed within virtual worlds. Gaming is an obvious use for VR, but its applications stretch far beyond placing players inside digital dungeons, with the potential to revolutionise communication, education, health and every other area where humans interface with digital technologies. But is it ready today? We've tried four of the latest VR headsets to hit the market, and the results are tantalising. Before we look at these headsets, let's take a quick look at the state of VR in mid-2015.

LUCKY GOT LUCKY

We can thank one Palmer Luckey for kick-starting the VR reboot back in 2013. At the time, this 22 year old had amassed the world's largest Head Mounted Display (HMD) collection, in a bid to figure out how to learn from the mistakes of the past to create a working VR HMD. He soon realised that the screens used in today's mobile phones were perfect for the job and, when paired with special lenses and motion trackers, were almost ready for VR prime time. His early prototype aroused the curiosity of John Carmack, the rock star programmer many credit with bringing 3D graphics to the mainstream courtesy of the

smash hit game *Doom*. With Carmack's support Palmer then launched the Oculus Rift Kickstarter campaign, and the rest is history. Oculus was acquired by Facebook in early 2014 for US\$2 billion in cash and stocks, and its first mass-market product is due to launch in early 2016. Initially aimed at serious PC gamers, the Oculus Rift HMD promises to solve the issues that plagued early VR headsets.

QUASHING VR'S QUIRKS

Motion tracking accuracy and latency are two crucial ingredients for lowering the puke-factor of virtual reality, and it's here that the 90s headsets failed so miserably. If the headset doesn't precisely follow the user's movements, the brain gets confused, leading to nausea. Likewise, if the image on-screen lags behind the player's movements, motion sickness sets in.

The Rift solves the motion tracking issue by using an external IR camera in conjunction with internal accelerometers and magnetometers, while latency is kept below 20ms at all times. The result is a HMD that can be used for hours at a time, without any stomach-churning results.

The other issue with VR is the resolution of the screen, and it's here that the technology is still lacking. With the screen sitting just an inch or so away from the user's eyes, whilst also being magnified by special lenses, it's easy to spot the pixel structure of the display, even when the screen packs in a resolution of 2160 x 1080, as seen in the existing Rift Developer's Kit 2.0. We think it'll require at least 8K screens before pixels become invisible, which should arrive within the next four or five years.

CRAWLING BEFORE WALKING

After testing the latest batch of VR headsets, we have to say that we're incredibly impressed by the potential of this technology. We have no doubt that VR will indeed be adopted by the masses, but it's worth pointing out that we're at Day 1 of the VR revolution. It's going to take many years for the technology to mature to the point where the virtual experience is indistinguishable from the real world, at a price point mere mortals can afford. But even with today's limitations, VR headsets make traditional 2D displays feel like mere windows into virtual worlds, while HMD's finally allow us to step inside them.

While there are around ten different VR headsets currently in development, only five are readily available at a price point ready for mass consumption. The Zeiss VR One is one such headset, but sadly the company chose not to send a sample out for review.

04

VR HEADSETS

HOW WE TESTED

As Rift, Gear VR and Google Cardboard/LG VR for G3 all offer different services, we picked the top free racing and shooting games for each platform. We also tested the various VR videos on offer. In all tests we paid attention to latency, resolution, comfort and overall image quality.



LG VR for G3

A PLASTIC VERSION OF CARDBOARD.

LG HASN'T JUST borrowed a leaf out of Google's VR book; it's ripped the page out and photocopied it. The LG VR for G3 is basically a premium edition of Google Cardboard, built from sturdy plastic and ready to roll straight out of the box.

As it uses the exact same design as the Cardboard, including the very same apps, the VR for G3 suffers many of the same issues. LG hasn't included any way to mount the unit to the user's face, and holding it up for longer than five minutes gets even more tiring than the Cardboard, as LG's unit is substantially heavier.

It's definitely more comfortable though, as the rounded edges of the plastic chassis don't dig into the flesh anywhere near as much as the rough cardboard of Google's unit. Controlling games is handled exactly the same as the Cardboard, with a metal ring that slides down one side of the unit; this is attached to a magnet, which triggers the magnetic gyro sensor in the phone. Speaking of which, as the name indicates, this unit only works with LG's G3 smartphone. This has the same 1,440 x 2,560 resolution of the Samsung Galaxy S6 we used with Cardboard, and thus the pixel structure was relatively minimal. However, it's just as laggy as the S6, with a definite pause between when the player moves their head and the on-screen image updating.

LG is giving this device away for free to those who have registered their G3's warranty, or those who buy a G3 via Optus, which makes obtaining this a no-brainer. It mightn't be the VR device that will sell you on the concept, but as a freebie that delivers a little bit of fun, it's highly recommended.

Oculus Rift Developers Kit 2 (DK2)

THE ORIGINAL IS STILL THE BEST.

UNLIKE THE OTHER units, the Rift DK2 is built from the ground up as a Head Mounted Display, rather than jury rigging a smartphone to do the job. As such, it offers a vastly improved experience over the competition, especially as it's meant to be plugged into a PC, unlocking a vast treasure trove of free demos that can be controlled with a control pad or mouse and keyboard. It's aimed at developers though.

At the heart of this unit is a Galaxy S3 Note screen (Oculus and Samsung have a very close relationship, hence why the Gear VR launched before the consumer version of the Rift, which is the only disadvantage. The lower resolution makes pixel-spotting much easier, which in turn leads to a jagged, aliased image. However, it's being driven at a high refresh rate of 75Hz, while all of the internal electronics strive to keep the latency below 20ms, well within the range of comfort.

It also offers a much higher field of view, removing the blinkered effect that the other models suffer from, while the head mount and low weight makes it much comfier for longer periods of use. This is currently the best VR headset for consumers, but the Consumer version releasing in early 2016 is even better. We've tested a prototype of this, and the leap in resolution makes it a near perfect experience. Until then though, the DK2 is your best bet if you're serious about trying out VR.



LG VR FOR G3

Free to existing G3 owners, limited stock
www.lg.com/au

CRITICAL SPECS

Requires LG G3 smartphone; NFC chip; plastic construction.



LACIE MIRROR

US\$350
www1.oculus.com/order/

CRITICAL SPECS

1920 x 1080 (960 x 1080 per eye); 75Hz refresh rate; IR positional tracking camera.





Google Cardboard

A LOW-FI SOLUTION TO A HIGH-TECH PROBLEM.

GOOGLE'S CARDBOARD IS easily the most affordable way to get a taste of VR, being little more than a sheet of cardboard, a set of cheap plastic lenses and some Velcro and sticky tape. Google doesn't actually make the kits — they simply designed it, and a bunch of third parties now sell their unique versions of it. There's no screen included in the pack, instead utilising your existing smartphone's screen. Assembling the flat-packed unit takes less than a minute, and once it's up and running there are hundreds of free apps on both Google Play and the App Store.

We tested the Cardboard with a Samsung Galaxy S6, which has a screen resolution of 1,440 x 2,560 pixels. The first issue we noticed is it's not very comfy — the sharp cardboard edges don't sit nicely on the face, while the lack of a strap means the user has to hold it up with their hands, which gets tiring quickly. There are also no controls on the unit other than a small switch on one side, so navigating apps can be painful. The final issue is latency, with more complex scenes feeling very laggy.

However, we were incredibly impressed by the resolution of the device. Thanks to our phone's high resolution, pixels were rather hard to find, especially in apps that used large blocky, bold design. Viewing 3D objects and videos was truly exciting, making it easy to overlook the many problems this low-tech gadget suffers from. It's not the kind of VR headset you'll wear all day, but it's fantastic for demonstrating just how immersive VR will be.



Samsung Gear VR Innovator Edition

THE RIFT DK2'S SEXIER, YET SLIGHTLY POORER, COUSIN.

THE PRICE ON this HMD looks mighty affordable given the excellent build quality, but it omits one important thing — this HMD requires a Samsung Galaxy Note 4 to work. That's great if you already own this phone, but makes this an incredibly expensive novelty item if not.

The S4 slots into the front of the unit, and the user can then adjust the focal point to get the clearest picture. A Micro-USB port attaches the phone to the headset, giving the user access to a touch pad and several buttons, making navigating Gear VR apps vastly simpler than the Google Cardboard apps. However, there's still no control pad, unlike the Rift, forcing most games and experiences to use simplistic motion controls.

Samsung must be commended for the brilliant design of the HMD, with the various straps holding it firmly in place without any discomfort. We wore this for over an hour at a time without feeling like something foreign was digging into our skull. The S4's native resolution of 1,440 x 2,560 is nice and crisp, but it's obvious the hardware within doesn't have the grunt necessary to pump out games with extremely low latency, as a little lag is noticeable. However, on the flipside the Gear VR ecosystem is much more seamless and easier to use than the Rift's developer-centric app site.

It's not quite up there with the Rift DK2, but the Gear VR is a fantastic gadget for existing owners of the Galaxy Note 4. Our only concerns is the price, as few of the Gear VR games or 3D movies are compelling enough to make this more than a fun toy to bring out when friends are over. ■



GOOGLE CARDBOARD

Starts at US\$24
www.google.com/get/cardboard/

CRITICAL SPECS

Supports phones up to 6 inches; iOS and Android compatible; no screen included; NFC chip.



SAMSUNG GEAR VR INNOVATOR EDITION

\$299
www.samsung.com.au

CRITICAL SPECS

96 degree field of view; weight: 379gr; requires Galaxy Note 4.

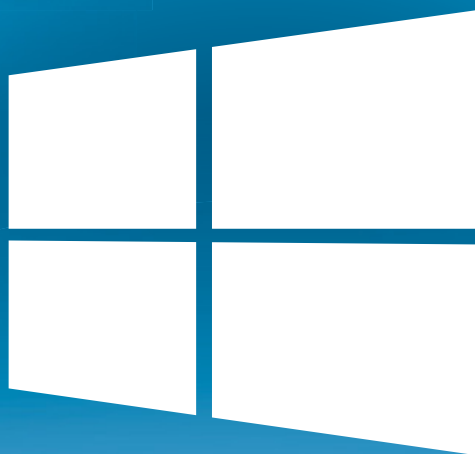


HOW TO GET IT FOR FREE

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You can upgrade right now for nix!

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Get to grips with the all-new Start menu & speedy Edge browser!



WINDOWS 10 IS HERE!

MICROSOFT'S BOLD NEW OS FOR PCs, TABLETS & SMARTPHONES HAS FINALLY ARRIVED... SO IS IT ANY GOOD?

YOUR QUESTIONS ANSWERED: WHAT'S NEW, WHAT WORKS (AND WHAT DOESN'T) + SHOULD YOU UPGRADE?



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[WICKED WEARABLES — VIRTUAL REALITY]

Experience VR now

SO, YOU'VE GOT YOURSELF A HEADSET. HERE'S HOW TO FIND CONTENT TO WATCH.

[JENNETH ORANTIA]

EVERY FEW YEARS, the technology industry spits out a new display standard. Going back to 1999, it was DVD, which represented a huge leap forward in image quality from the existing analogue video cassettes. Then, about five years later, high definition became the new normal.

The upgrades have been somewhat gimmicky in following years. 3D tried to have a go at it for mainstream use in 2010, and while it's technically now a standard feature on most high-end televisions, the most popular way to watch the handful of 3D movies that come out of Hollywood continues to be the cinema.

4K is one of the newest display standards that quadruples the pixels of Full HD (even though the improvement isn't necessarily four times better), but it's still struggling to take due to a lack of content and the logistical nightmare of distributing of little content there is.

Virtual reality headsets are only just entering the scene, and promise to be the greatest display revolution yet. These don't enhance the existing video content so much as provide a completely new viewing experience. Remember that scene in *Matrix* where Morpheus plugs Neo into the Matrix for the first time? The current standard of virtual reality isn't quite as all consuming as that, but it's in the same ballpark.

Virtual reality headsets combine stereoscopic 3D with head-tracking technology that smoothly change the 3D image in real time wherever you look. In other words, there's no end to the screen like there is for the traditional screen. Looking left, right, up or down produces a new perspective which tricks your brain into thinking what you're seeing is the real thing. Your present environment completely melts away in favour of the virtual setting. 3D video.

We reviewed the newest batch of VR headsets on page 68. Once you've acquired one of these, your next step is finding good content to play on it. Here's how to find content for the two VR headsets that are currently available to consumers in Australia: the Google Cardboard (including LG's VR for G3 version) and the Samsung Gear VR.

TYPES OF CONTENT

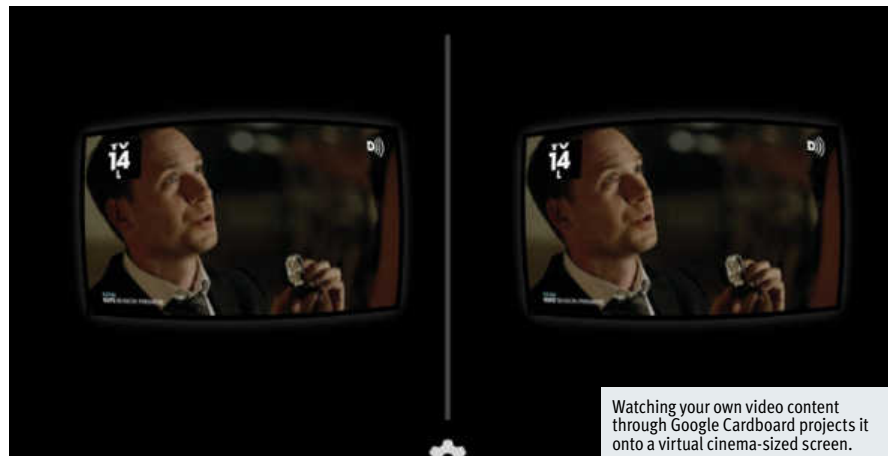
VR vendors like the Facebook-owned Oculus, Steam and Sony are pushing video games as the main attraction, and for good reason. If you think about how immersive first person

shooters, simulators and role-playing games are already on a 2D screen, the virtual reality experience takes it to the next level and plunges you headfirst into the action.

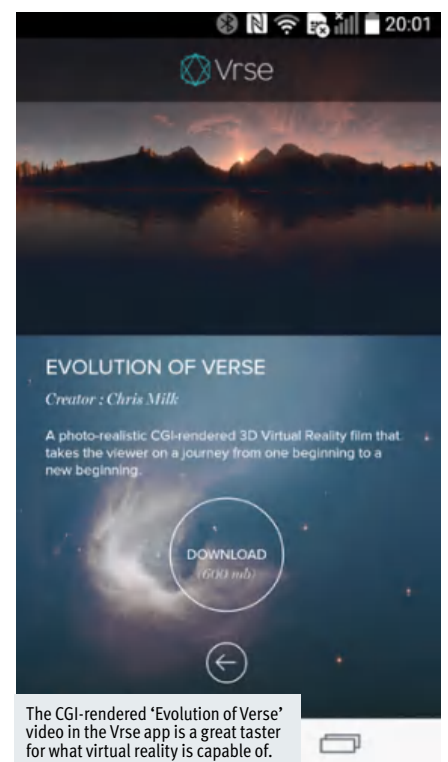
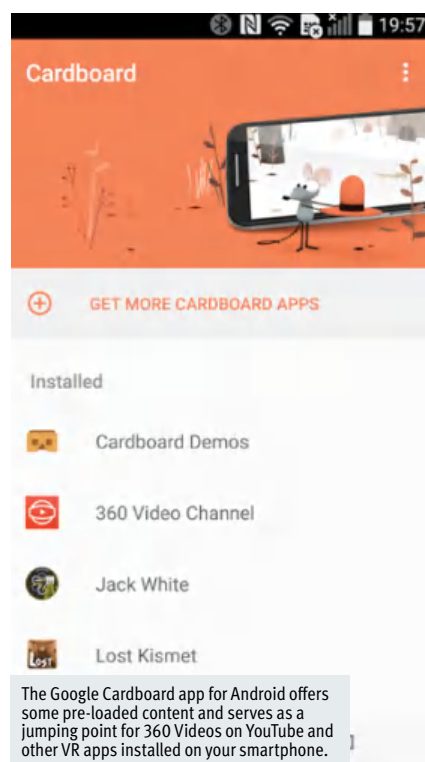
Videos are another natural fit for virtual reality. Instead of simply watching the movie as a passive observer, you're actually on the set and can see explore the scene by looking all around you. There are certain types of content that this

lends itself well to. Experiential scenes like watching a waterfall, being underwater or watching a concert works, as does 'visiting' a museum or someone's house.

But VR video comes with its own challenges. The fact that the viewer can look anywhere means the standard film-making techniques conventions don't work, and film makers have to find new ways to unfold the narrative and tell



Watching your own video content through Google Cardboard projects it onto a virtual cinema-sized screen.



a story from each 360-degree scene.

You can also watch regular movies on a virtual reality headset, which simulates the experience of watching it on a huge cinema-sized screen. If you want to watch a movie and don't want to stare at a small smartphone screen, this can be a cheap and convenient way of getting the cinema experience from anywhere you are — just supply the popcorn.

VR photos are similar to video, only there's no movement — you can explore the captured scene as a 360-degree panorama. This is actually more impressive than it sounds. The fact that you can see the photo from every angle still makes it seem like you're actually there — even though nobody's actually moving. In any event, it's a huge leap forward from looking at pictures on a flat computer screen or page.

FIND VIRTUAL REALITY CONTENT FOR GOOGLE CARDBOARD

If you have an Android smartphone and a Google Cardboard headset, you'll find plenty of free content within the Google Play store. All of these are installed as discrete apps on your smartphone, and you can either launch them independently or access them from the Google Cardboard app.

The official Google Cardboard app is a good place to start, offering up a variety of 'experiences', such as flying around the world in Google Earth, going for a Street View tour, streaming YouTube videos, and watching an animated mouse in a forest. You can also use the Google Cardboard app to view photospheres that you've created on your smartphone using the Google Photo Sphere app, as well as watch movies that you have stored on your phone in a cinema-like environment.

Your next port of call should be the Vrse app, which is regularly updated with free, high-quality content. You'll have to download each video before you can play it, with file sizes ranging from 225MB to 1.1GB, but it's well worth the bandwidth.

Vrse automatically starts downloading the latest video, Walking New York, which is a documentary created by New York Times magazine that chronicles the creation of a large scale street art installation. But if you want to see what VR is really capable of, try Evolution of Verse, which is a beautiful CGI-rendered short video that includes a train crash that crashes into you and explodes into a flock of birds. Other videos include a VICE News march co-created by Spike Jonze and a documentary about a Syrian refugee camp.

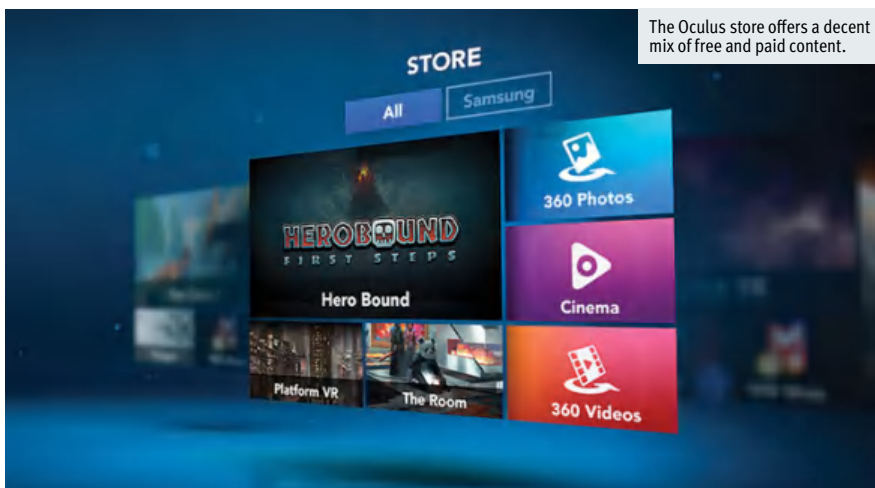
Jaunt also has a good selection of content as individual apps, including concerts by Paul



Roller Coaster VR is one of many virtual reality roller coaster apps that do a pretty impressive job simulating the experience.



The creepy A Chair in a Room app is mostly dark, with a spotlight moving over parts of the room.



The Oculus store offers a decent mix of free and paid content.

McCartney, Jack White and Big Sean, a rock-climbing experience in Utah and Yosemite National Park, and a 'black mass' horror film.

To check out a large library of 360 photos, Orbulus for Cardboard VR offers a huge selection that spans museums, Mars, and everything in between.

There is plenty more virtual reality content in the Google Play Store and it's increasing by the week, so it's well worth exploring the existing catalogue and checking back regularly. We recommend trying one of the roller coaster apps like Roller Coaster VR for a stomach churning

experience, sampling the many horror films and games like *A Chair in a Room*.

iOS users aren't left out of the fun, though. The newest Google Cardboard headset supports the iPhone when used with the Google Cardboard app, and there are various other virtual reality apps you can take advantage of such as YouTube, Vrse and Jaunt VR.

FIND VIRTUAL REALITY CONTENT FOR GEAR VR

Unlike the Google Cardboard, Samsung's Gear VR comes with content out of the box in the

Getty has recently joined forces with Oculus, offering up its catalogue of high-quality 360-degree videos through the VR platform.



form of a microSD card — but only if you purchased the one designed for the Galaxy Note 4.

Once you put a compatible phone into the Gear VR, it recognises the headset and downloads all of the necessary files. Make sure you're on a Wi-Fi network with plenty of bandwidth when this happens, as you'll need to download multiple large apps and content before you can use the headset.

The Gear VR's base of operation is the Oculus app. As soon as you slot your phone into the headset's cavity at the front, it will automatically launch the Oculus app (assuming all of the necessary files have been downloaded), and deposit you at the home screen. Unlike the standard 'home' screens that you'd be used to, this actually is a home when you look around, complete with hardwood floors, floor to ceiling windows, a living room, dining room and kitchen.

Look to your right to see the 'Library' folder and tap the touchpad on the right of the headset. This shows all of the content that is preloaded on the provided microSD card (as well as any apps that you install at a later stage), including Strangers with Patrick Watson (a short video where Canadian singer-songwriter performs a song from his loft apartment), and a Cirque du Soleil Vegas performance that has you right on stage with the performers.

There's plenty more where that came from in the Oculus Store. A mixture of free and paid content from a variety of sources can be downloaded to your device, such as 'companion content' from blockbuster movies (including the *Marvel Battle for Avengers Tower*, *Shatter Reality* experience from the *Divergent* series of movies, and *Jurassic World: Apatosaurus*), fun action and puzzle games such as *Hero Bound* and *Templerun VR*, and experiential content for visiting places as far flung as British Columbia, Canada and ancient Korea.

The quality of games on the Gear VR platform is generally higher than what you'll find for Google Cardboard, owing to its Oculus origins. For some of these, you'll need to connect a Bluetooth gamepad in order to access all of the necessary controls. If you're happy to

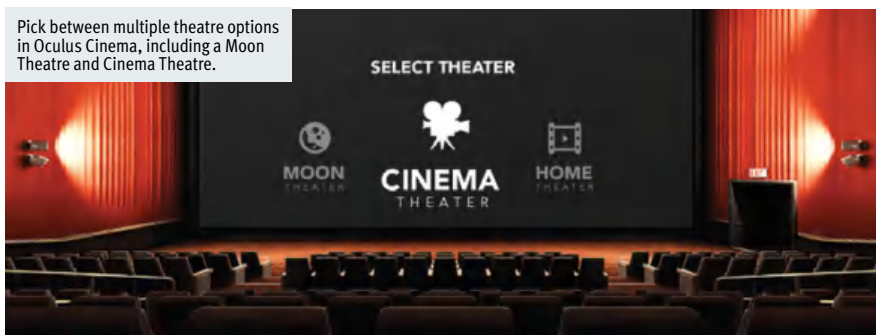


VR Karts: Sprint is a fun Mario Kart-style racing game with cute graphics and fun gameplay.

You can create your own private cinema, complete with virtual 100-inch screen and chairs, using the Oculus Cinema app.



Pick between multiple theatre options in Oculus Cinema, including a Moon Theatre and Cinema Theatre.



plonk down some cash, we recommend the Mario Kart-like VR Karts: Sprint game.

Once you tire of the moving pictures, head over to the Oculus 360 app (if you can't see it from the home page in Oculus, go to the Library section and select Oculus 360 Photos). You scan

scroll vertically through the different photo albums, or tapping on the menu button at the bottom will bring up all of the category names in text. Getty Images has recently launched a collection in Oculus 360 photos, and from here you'll be able to see things like the Cannes Film

Festival and the 2014 FIFA World Cup.

The Oculus Cinema app (also found in Library if not on the home page) is where you'll be able to watch your own movies in a fancy cinema setting. You'll need to stick the movies in a specific folder on your microSD card (/DCIM/Movies/Oculus/Movies/) before they'll appear in the thumbnail view, but once it's setup, you can choose between a home and cinema theatre, watching it amongst ants or on the moon, or just a plain black background. The realism of the 'cinema' background and large-sized screen is uncanny, and if you watch movies on your smartphone on a regular basis, this is likely going to become your preferred method for doing so.

WHERE TO FIND CONTENT OUTSIDE OF THE STORES

The store that's native to your VR platform is a good starting point, but you're bound to exhaust the options there quickly. Lucky for you, there are plenty of other ways to get VR content.

User-generated content is certainly one option, and ever since Google launched support for 360-degree videos in YouTube earlier this year, there's been a steady stream of home-grown and professional VR videos hit the streaming platform.

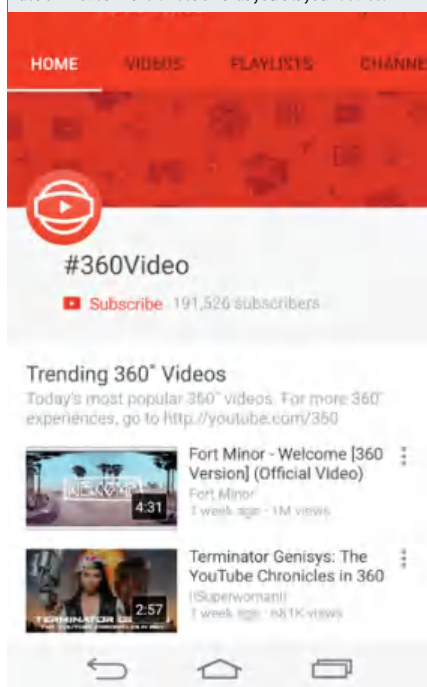
Google Cardboard users can access the YouTube video channel from the smartphone interface of Google Cardboard. Tap on '360 Video Channel', and you'll find dozens of videos in different categories and varying levels of quality, from trending and dance through to 'total fear' and 'driver's seat'. The cool thing about the 360-degree videos on YouTube is that you don't necessarily need a virtual reality headset to experience it.

Once the video starts playing, moving your phone around will automatically change the perspective of the video, so you can turn around, look up and to the left and right to see more of the on-screen action.

Of course, viewing in this manner doesn't produce the proper virtual reality experience. To get this, put your phone into the Google Cardboard headset and press the small cardboard icon in the right-hand corner.

Sadly, there's no native way to watch the 360 videos on YouTube through the Gear VR, although there are workarounds that entail downloading each clip from YouTube. Samsung's Milk VR service is somewhat of a stopgap solution for user-generated 360-degree videos, and while it's technically only available in the United States, it's possible to download it if you trick the Oculus store into thinking you're accessing the site from abroad. The selection is paltry compared to YouTube, but you'll be able

The 360 videos on YouTube can be watched with or without a virtual reality headset. Without a headset, the on-screen action moves in the direction that you tilt your device.



There are dozens of 360 videos on YouTube, including a music video by artist Avicii.



to see Iggy Azalea perform on stage, go underwater diving with sharks, and watch an NBA Basketball game.

To download Milk VR, go to the Play Store and download Hola Free VPN — a free VPN redirecting app. From within Hola, load Oculus and leave the default option to launch from a US VPN. Find the Milk VR app in the Samsung tab and install it. Once it is installed, start the app and it will ask you to start it in virtual reality mode. Put your phone in the Gear VR and Milk VR will launch automatically. In future, you'll need to have Hola Free VPN running any time you want to use the Milk VR service.

MAKING YOUR OWN CONTENT

As you might imagine, creating 360-degree video is no easy feat. Even if you manage to create a multi-camera rig that shoots video from every direction (there are custom rigs available that utilise as many as 16 GoPros), the harder

part is actually editing all of those video files together into a seamless 360-degree movie.

At the Google I/O conference last May, Google announced a new virtual reality video platform called 'Jump' that it's hoping will make it easier for people to create spherical 3D virtual reality videos. It also partnered with GoPro to unveil a monster-sized Jump-compatible camera rig consisting of 16 GoPros called the '360-Degree Camera Array'.

The sheer size and cost of these rigs makes them unreachable for the average consumer, but creating 360-degree photos is something that anyone with a smartphone can achieve thanks to the Photo Sphere feature built into the Google Camera app for Android. Google has also released a standalone version of the feature for iOS users called Photo Sphere Camera. ■

[WICKED WEARABLES - THE FUTURE]

The future of wearables

WEARABLE TECHNOLOGY IS SET TO CHANGE HOW WE LIVE AND WORK, BUT IS THERE A COST? WE INVESTIGATE WHAT'S IN STORE.

[DARREN YATES]

THERE'S ALWAYS SOMETHING exciting about a brand-new technology — it's raw and rarely perfected, but often loaded with seemingly limitless possibilities. Right now, that about sums up wearable technology — its part 'Apple Watch' but also part 'underwhelmed consumers'. In fact, you're as likely to read an enthusiastic review of the Apple Watch as you are reasons why you shouldn't care about wearables yet. To many, they're brilliant but baffling, powerful yet puzzling.

As with any new technology, wearables are surrounded by a busload of market hype. Even market research firm Gartner says as much. According to its latest yearly Hype Cycle of Emerging Technologies (www.gartner.com/newsroom/id/2819918), wearable tech is right up there, having just fallen off the Peak of Inflated Expectation and begun the dive into the Trough of Disillusionment.

But that's not the end of the story — not by a long shot.

MASSIVE MONEY

At the same time, the potential for wearable technologies almost borders on the outrageous. For instance, Gartner expects some 25 million head-mounted displays will be sold by 2018 (tinyurl.com/nrns6s). Rival analysts IDC forecasts a massive 173% jolt this year in wearable sales from 24.6 to 72.1 million. By 2019, it reckons that number will top 155 million, thanks in large part to a boom in sub-\$100 fitness trackers (tinyurl.com/nm255qb). UK research firm, Juniper Research,

sees the market for wearables tipping US\$80 billion by 2020 (tinyurl.com/parf3jr).

It's all part of what's being touted as the 'Intelligent Systems' market that includes everything from wearables to connected cars. IDC has a dollar amount it thinks this market will be worth by 2019 — a staggering US\$1 trillion (US\$1000 billion, tinyurl.com/npn66hq). No wonder you've got just about every company on the planet having a crack at something involving wireless connectivity.

CHALLENGES

But peel away that hype and wearables still have plenty of work in front of them to get passed the novelty 'companion' tag. There are two key issues — one is perfecting the small-scale user interface; the other is electrical power. No-one is interested in a device that's more complicated to use than a VCR, nor do they want to carry a car battery in their pocket.

But possibly even scarier are the reports of consumers losing interest in their wearable devices — lots of consumers. Some of those reports are claiming as many as one-third of fitness tracker owners have downed tools after a few months; others fully one-half of users (tinyurl.com/olx9z3j).

On the technology front, the reality is we haven't seen a new battery tech reach commercial maturity since the release of Lithium-polymer well over a decade ago. But there is real potential on the horizon — Stanford University's Aluminium-ion battery is one of the most promising developments this



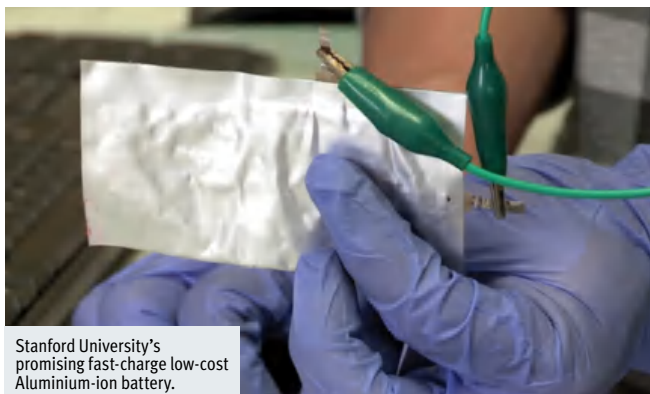
Fitbit has a growing wellness business aimed at the corporate sector.

century and could turn the wearables industry on its ear (tinyurl.com/p3ea67d). A battery that can charge in 60 seconds, recharge over 7,500 times and is low-cost? Who wouldn't sign up to a boxful right now?

SEEING THE FUTURE

While Apple's Watch has captured plenty of attention, the horizon is actually full of smart eyewear — and it's not all about consumers either. There's growing expectation that business could easily become the future driver of wearable technology. For example, German logistics giant DHL carried out a pilot program in The Netherlands earlier this year in conjunction with Japanese technology maker Ricoh and German wearable tech company Ubimax. The program involved providing DHL warehouse staff with smart glasses rather than the usual hand-held product-picking devices. The result was a 25% increase in efficiency over the trial period (tinyurl.com/pgk43j7).

And DHL's not alone — US smart glasses maker Vuzix has teamed up with enterprise software maker SAP to create two mobility apps — SAP AR Warehouse Picker and SAP AR Service Technician (tinyurl.com/psrmlv4) that work with Vuzix's M100 smart glasses. The continued demand for efficiency savings all but assure smart glasses of becoming a corporate accessory for many industries. In fact, if you're a



Stanford University's promising fast-charge low-cost Aluminium-ion battery.



DHL's smart-glasses trial on workers found a 25% efficiency gain.

Microsoft's HoloLens promises to bring 3D holograms into your world view.



Recon Instruments, maker of the Jet smart glasses, was bought by Intel in June.



warehouse manager or in logistics, we'd be surprised if you weren't wearing a pair within the next five years.

SECOND-GEN EYEWEAR

The smart glasses landscape has clearly changed in the last couple of years since the initial launch of Google Glass. While lesser-known names like Vuzix and Ubimax are kicking goals in the corporate space, some of the biggest brands are also taking positions to grab a chunk of the market.

Chip maker Intel announced in June this year it had purchased Canadian-based Recon Instruments, maker of the sports-focused Recon Jet smart glasses. According to the announcement, the Recon team will now be part of Intel's New Devices Group, developing next-generation head-mounted displays (tinyurl.com/ortr865). And then there are the (so far) unconfirmed reports of Glass 2 nearing completion from Google. While the Mountain View company hasn't yet said anything officially, Ray-Ban and Oakley eyewear maker Luxottica let it be known its working with Google on version 2.0, which is also rumoured to have replaced the original Texas Instruments OMAP4430 dual-core CPU with an as-yet-unspecified Intel processor chip (tinyurl.com/n62tpts).

HEADSETS HEATING UP

With Facebook flashing the credit card to the tune of US\$2 billion to grab hold of Oculus Rift, there's clearly no shortage of interest in the gaming headset market. And not surprisingly, old console rivals Sony and Microsoft are set to crank up the competition, although their plans go way beyond gaming itself.

Microsoft turned heads earlier this year with the unveiling of HoloLens (tinyurl.com/llzbhht), its untethered holographic computer headset that augments your view of the world with 3D holograms. Like its Kinect sensor, HoloLens has applications extending well

outside of the gaming arena and Microsoft is keenly promoting it as the ultimate accessory to almost any application, from *Minecraft* to its up-coming Windows 10 operating system, even introducing it into artistic and 3D modelling applications.

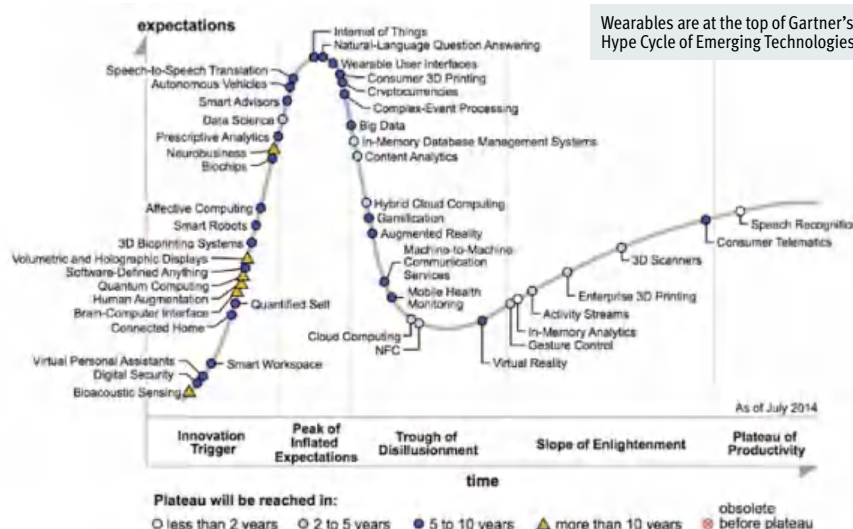
Meanwhile, Japanese giant Sony demonstrated its Project Morpheus VR headset at the recent 2015 E3 gaming and entertainment expo (tinyurl.com/luugnvv), with the aim of bringing Oculus-style gameplay to the PS4 console. Sony is free enough with its basic specs — a full HD (1080p) resolution OLED panel, capable of up to 120Hz refresh rate and a latency (delay) time down to 18-milliseconds. This most recent second-generation hardware is also said to have faster and more accurate head-tracking than Sony's original incarnation. At this stage, however, Sony says we'll have to wait until 2016 before Morpheus hits store shelves.

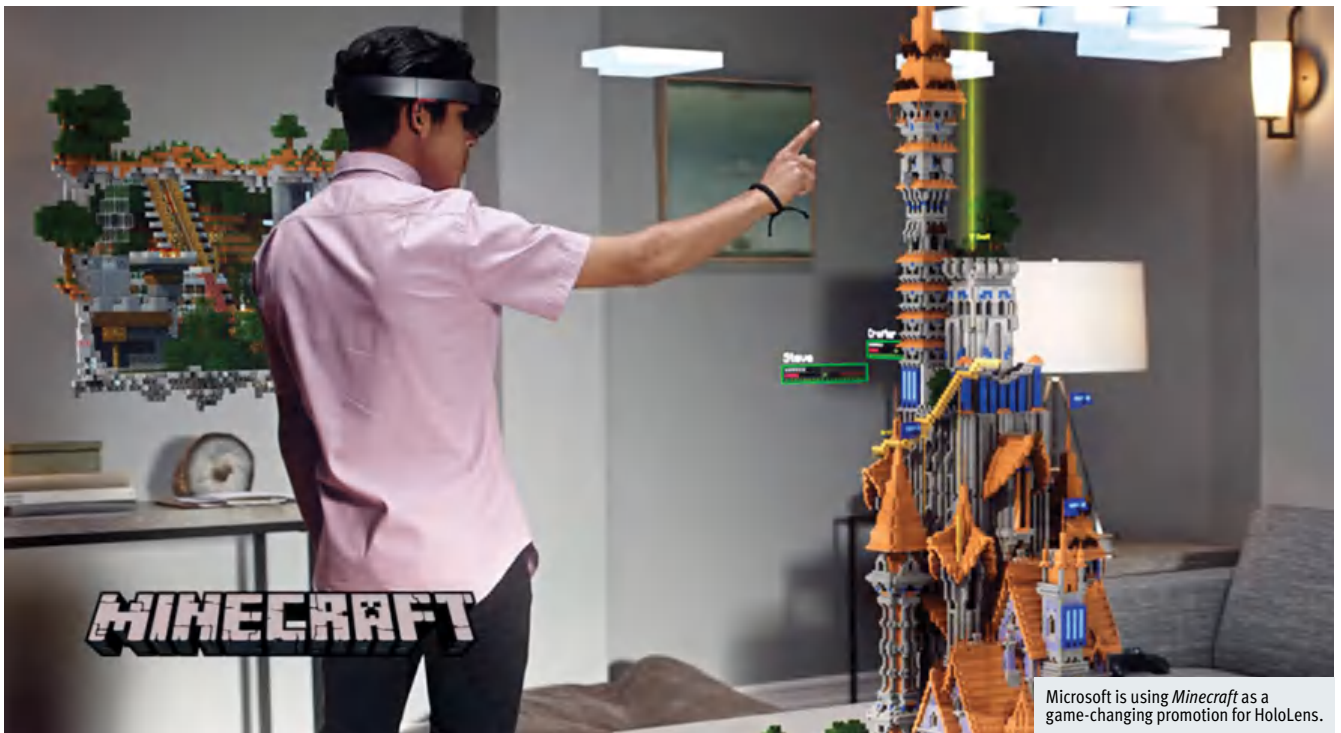
But Sony has also been busy on the smart glasses front, releasing details on the SmartEyeglass and the clever SmartEyeglass Attach, the latter able to clip onto any pair of glasses. According to Sony specs, Attach

features a 0.23-inch WVGA (640 x 400-pixel) display, but there's no firm release date or pricing details as yet (tinyurl.com/np3tekcc). However, similar to Google, it is offering a developer version of its SmartEyeglass now for US\$840. Here, the display panel is green-screen, 8-bit greyscale and 419 x 138-pixels, while Bluetooth 3.0, 802.11b/g Wi-Fi and a 3MP camera round out the major goodies on-board (tinyurl.com/ltrzhbrb).

PAYMENT WEARABLES

The natural focus of much of the wearables market is on 'smart' devices at the moment, but they could also eventually change the way we gain entry and pay for goods and services. One of the leaders in this market is US entertainment goliath, Disney, which has become an unlikely pioneer in wearable technology — and on a grand scale. It's using RFID (radio-frequency identification) wristbands to enable visitor entry into its resorts and theme parks, even for purchasing services (it gets linked to your credit card). The battery-powered 'MagicBand' is available





Microsoft is using *Minecraft* as a game-changing promotion for HoloLens.

Disney's MagicBand RFID bracelets provide entry to its theme parks.



through the Disney Store for US\$13.95 and includes an array of customisations from bands to name-engraving. Wired says Disney will spend US\$1 billion on the whole system by its completion (tinyurl.com/lr6gnj6).

In fact, the corporate mindset in the US is turning in favour of bringing wearable technology into play. US customer management company Salesforce released a study earlier in the year on the intentions of businesses to implement wearable technology (tinyurl.com/oxu4oeu). It found that a third of the near-1500 respondents already implement wearables in the workplace and of those, 79% believe the tech either is or will be strategic to their company's future success.



Sony's Project Morpheus will land for the PS4 in 2016.

WORKPLACE WEARABLES

Many of us use our own smartphones in the workplace. Chances are if you do and you're at a major company, you're part of a corporate 'bring your own device' (BYOD) program. But as the financial benefits of wearable tech continue to attract businesses like a moth to a flame, expect to see this expand into 'bring your own wearable' (BYOW) programs as well. There's debate about when it's likely to begin, but we think it's inevitable — and here's why.

Healthcare is fast becoming one of the major battlegrounds for wearable tech in the US, where employer-funded health insurance is often a key part of an employment contract. Unlike in Australia where the vast majority of employees cough up for their own insurance, healthcare cover in the US isn't cheap — but companies are finding ways to reduce their

premiums, including issuing fitness trackers to employees. Jiff (jiff.com) is one of the players in this new enterprise health benefits market and according to *Fortune* magazine, is already available to some 300,000 US employees including from companies such as beverage maker Red Bull and games developer Activision Blizzard (tinyurl.com/p5oe989).

WHAT PRICE PRIVACY?

It's part of a growing trend in corporate US where businesses are encouraging employees to join 'wellness' programs, which can be as specific as taking part in challenges such as agreeing to drink so much water, eat certain foods or walk so many steps a year for various incentives (tinyurl.com/o9sn9mb).

But while on the surface improved employee health outcomes and lower corporate healthcare



CSIRO's ReMoTe headset offers remote-access to experts in the field.



Sony's SmartEyeglass is now available to developers for US\$840.



Software maker SAP has a new warehouse app for Vuzix's M100 glasses.

+

"THERE'S NO DOUBT THAT WEARABLE TECHNOLOGY CAN OFFER MANY BENEFITS — FROM IMPROVED HEALTH AND LIFESTYLE OUTCOMES FOR CONSUMERS TO EFFICIENCIES AND COST-SAVINGS FOR BUSINESS."

premiums sound like a win-win, there are growing concerns about the cost to employee and consumer privacy. In the US, a PricewaterhouseCoopers study found that 86% of respondents were concerned wearable technology would make them vulnerable to security breaches, while 82% also feared an invasion of privacy. The reports' authors make the point that 'the more we outfit ourselves with data-gathering devices, the more exposed we are' (tinyurl.com/kq8f7uc).

THE REAL GOLD ISN'T HARDWARE

For while there's an obvious market in smart glasses, watches and fitness bands, there's possibly an even larger market to consider. In a similar way to how network access charges are potentially more valuable than the smartphone itself and how replacement inks can often cost as much as the printer, the gold isn't necessarily the wearable hardware, but in the mountains of data these devices will inevitably generate — data about your health, your activities, your buying patterns (tinyurl.com/qf3rbyb, tinyurl.com/q7qn39x).

In signing up for social media and other online services, we all tend to fly by the end-user

agreements and privacy policies in a hurry to join, but the data we leak is valuable.

In fact, if we're asking what price our privacy, it turns out, quite a bit.

The UK's *Financial Times* in 2013 sighted what it said was 'industry pricing data' on various bits of consumer information and found that the names, age, gender and location of 1,000 people was worth 50 cents — in other words, next to nothing. But throw in more personal information about specific health conditions and that information sold for 26 cents per person (tinyurl.com/ndhqwsj). It still sounds like nothing, but start looking at it by population and the numbers really begin to add up. Back in 2012, business advisory firm Boston Consulting Group found the value hidden in the personal data of EU consumers — their 'digital identity' — could 'deliver a 330 billion Euro annual economic benefit for organisations in Europe by 2020' (tinyurl.com/pw62k9m).

IS YOUR PERSONAL DATA SECURE?

And because wearables are still very much a nascent technology, we should be asking questions about data security as much as privacy. Researchers from security firm

Symantec put together some home-made wireless scanning devices in 2014 using off-the-shelf components built around Raspberry Pi computers. Taking these devices out on the road to public spaces in the US, the researchers not only picked up a range of fitness trackers being used, they were able to track the individuals wearing them. Even worse, they also found rookie data security mistakes such as unencrypted passwords transmitted in plain text (tinyurl.com/q73snlu).

THE BUMPY ROAD AHEAD

There's no doubt that wearable technology can offer many benefits — from improved health and lifestyle outcomes for consumers to efficiencies and cost-savings for business. But as the wearables market now begins hitting its straps, don't under-estimate the value of data security or how much your personal data is worth. Before you sign up to your next wearable device offering online data collection, make sure you check the brand's data-use policy and find out as much as you can about its data security. You might be signing up for more than you bargained for. ■

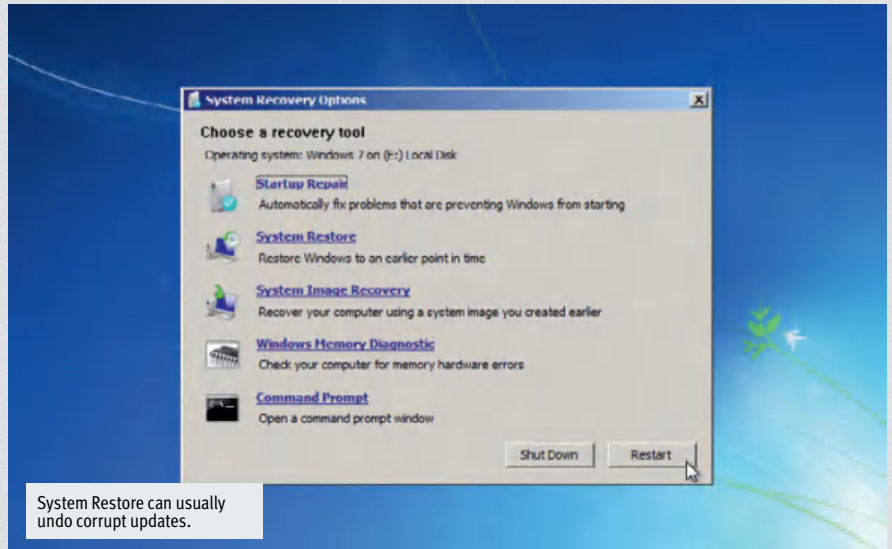
HELP STATION

GET THE MOST FROM YOUR TECH

[THIS MONTH IN HELP STATION]

- 80 **Q&A**
[YOUR QUESTIONS ANSWERED]
- 84 **Windows**
[MAKE YOUR OWN WINDOWS TILES]
- 88 **Mac**
[DO MORE WITH OS X'S TERMINAL]
- 90 **Android**
[USE A VPN ON ANDROID FOR SAFE WEB BROWSING]
- 92 **iOS**
[MASTER ICLOUD ON IOS]
- 94 **Download & stream**
[STREAMING MEDIA WITH VLC]
- 96 **Security & privacy**
[SLIPPING THROUGH SITE BLOCKADES]
- 98 **Home networking**
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- 100 **Photography**
[CORE PHOTOGRAPHY SKILLS: DEPTH OF FIELD]
- 104 **Home AV**
[HDMI 2.0A, 1.4, 4K, AND BEYOND]
- 108 **Smart home**
[SMARTEN UP THE KID'S ROOM]

You'll need a special stylus to get pressure-sensitivity when drawing on an iPad.



[WINDOWS]

Windows stuck at Startup Repair

I switched on my Windows 7 PC after the latest round of Windows Updates and now it's stuck in a loop, whereby it goes to Startup Repair, which attempts unsuccessfully to repair files before rebooting again. It's pretty frustrating. Please help — what should I do to break the cycle?

[SIMON JETHWA]

Graham Barlow replies: This regrettable behaviour can occur when a single update corrupts for some unknown reason during the update process. Fixing it is usually as simple as waiting for the start-up repair to fail, then choosing System Restore from the list of available repair options. Simon never got this option, so we tried to steer him towards an option on Startup to access recovery options, which he couldn't find either. He then managed to find a Windows 7 repair disc, but on running it discovered that System Restore was unable to restore the computer using the Restore point taken before the update occurred. At this point, Simon confessed that his computer had been unstable for some time. So it was increasingly clear that the installation was corrupt — it's possible that a timely use of the Check Disk tool or System File Checker would have caught and fixed the problems before they spread, but now the only solution was a clean install. Sadly though Simon had no backups in place. So we pointed him towards our "Recover data if your PC fails" tutorial from issue 401 of our sister mag APC, and this allowed him to take a drive image of the

computer — thus crucially saving all the data on it — prior to reinstalling Windows from scratch. So Simon is now being thoroughly schooled in the art of backing up his PC!



[IOS]

iSketch?

I'm an architectural illustrator, and on my iMac, I use a Wacom Intuos Pro graphics tablet. I also make sketches when I'm visiting clients, and have to scan these and import them to Photoshop. I'm considering an iPad to pass the time on train journeys, and it occurs to me that this might be usable as a sketchbook. Feasible?

[ANTHEA MARTINEZ]

Matthew Bolton replies: iPads aren't pressure sensitive. Drawing apps attempt to emulate this by varying line width based on the speed of a stroke, but it isn't quite as good. However, there are styluses that send pressure information over Bluetooth. Try the Adonit Jot Touch with Pixedpoint (about \$130).



[HARDWARE]

New PC won't play my DVDs

I've just bought an Acer Aspire PC, but can't play DVDs. It will play music discs, however. Could you advise me on what external DVD or Blu-ray player to get that will play DVDs?

[ROYSTON GREENWELL]

Mayank Sharma replies: At first we thought this was a simple software problem to do with playing DVD films — Windows 8 no longer ships with a

Optus and Telstra offer ways to boost mobile reception within a localised area.

If your DVD drive only recognises CDs, you're in trouble...

DVD player, so you need to download a third-party tool for the job, such as VLC Media Player (videolan.org). However, in the course of our correspondence with Royston it quickly became apparent this was a bigger problem: the drive wouldn't read or play any DVD discs — data or video, although it could still recognise and play CDs. This is symptomatic of a hardware failure whereby the laser diode used for reading and writing DVDs isn't working — Royston got on to Acer, who responded by arranging a pickup and repair of the computer. Before sending it off, however, we advised Royston to back up any data first — just in case the entire computer ends up being replaced, as opposed to just the drive itself.



[WINDOWS]

Problems with Safely Remove Hardware

Every time I click the Safely Remove Hardware and Eject Media button in the Taskbar, nothing happens. I've created a shortcut on my desktop as a workaround, but it's not the same. Can you help? I'm running Windows 7 on a Dell laptop.

[ANDREAS CHRISTOU]

Nick Peers replies: There are a number of fixes you can try — you could, for example, check that the 'Devices and Printers' shortcut on the Start menu is working correctly. If it's not, then check the Bluetooth Support Service is running by clicking 'Start > Run', typing `services.msc` and pressing Enter. Scroll down — if it's not, restart the service and set it to 'Automatic (Delayed

Start)'. This should bring back both. If this fails, it's worth clicking the button and waiting, for perhaps up to a minute — if the list eventually appears then it could be linked to a networked printer. To sort this out, open 'Devices and Printers', select the printer and click 'Print server properties'. Switch to the Ports tab, select 'Standard TCP/IP Port' and click 'Configure Port', then untick 'SNMP Status Enabled'. Click OK twice and the problem should be solved. If neither of these circumstances are relevant, then simply bypass the 'Safely Remove Hardware...' button altogether — instead, click 'Start > Computer', right-click the offending device and choose Eject. Andreas was pleased to report this method worked perfectly.



[NETWORKING]

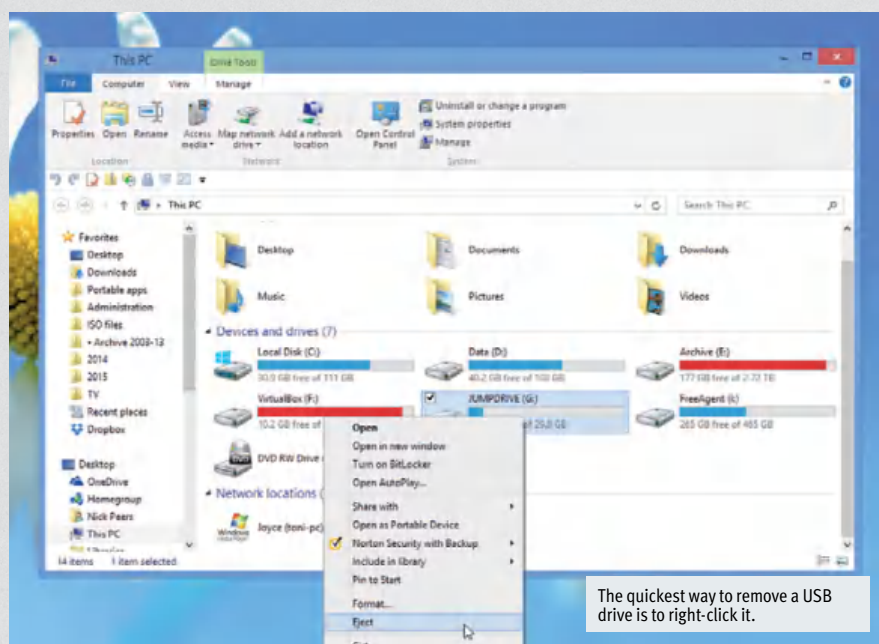
Boosting phone reception

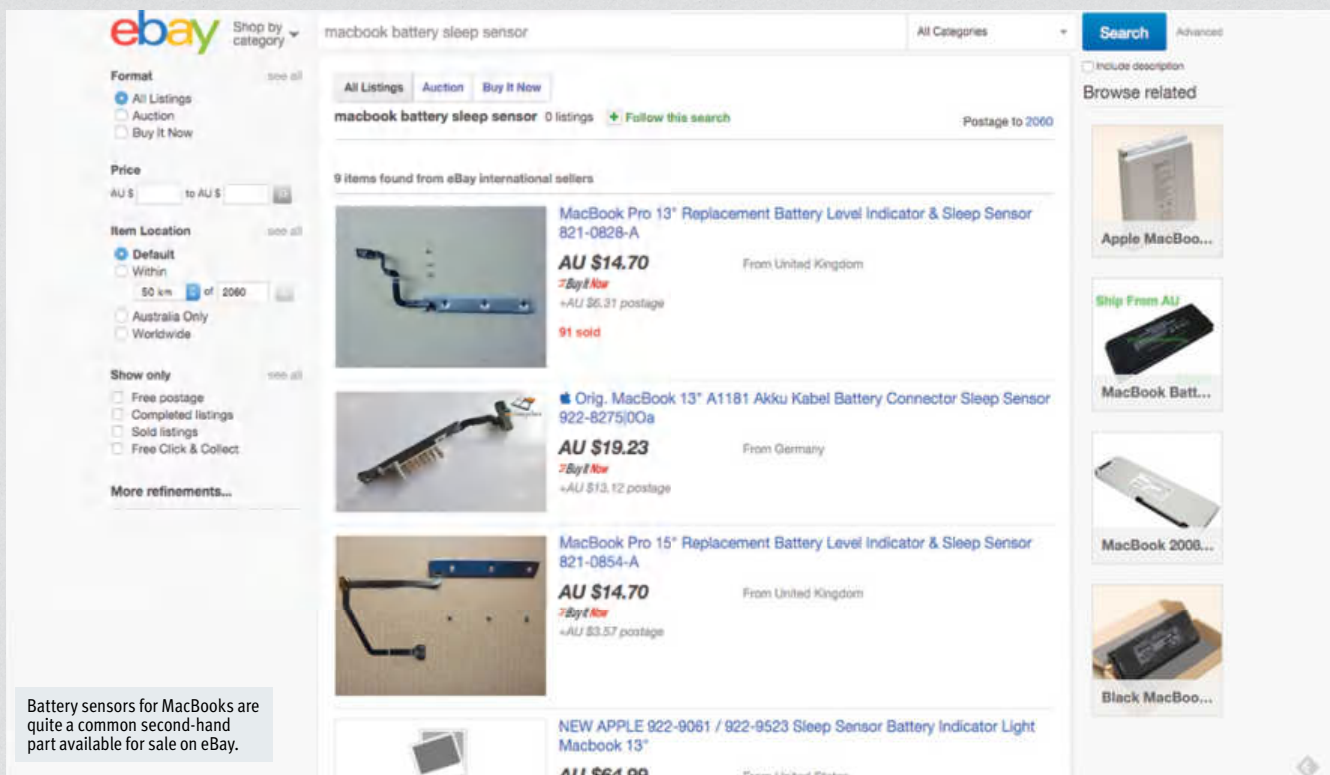
I live in a rural area, and despite being so close to a mobile phone mast that I can see it from the end of the lane, I have almost no mobile signal in my house. My Wi-Fi signal is strong throughout the house. Is there a way to use this to make and receive calls on my smartphone?

[PETER MERCHANT]

Matthew Bolton replies: You can use the Skype app to make voice calls over your internet connection, but to be generally reachable by non-Skype users, you'd have to rent a Skype Number. These cost \$5-6 a month, and once you have a physical number you could set your smartphone to divert to it whenever you are not reachable by tapping `**62*` and then the full Skype Number, followed by #. You could also do this with a landline number.

If you're with Optus, it may be possible to install a 'femtocell', which is essentially a mini mobile phone mast for your house that plugs into





your home broadband. Talk to Optus to see if you qualify for one. Telstra offers a repeater that also aims to solve signal problems, although it requires a spot with strong mobile reception and doesn't piggy-back on your home broadband connection.



[HARDWARE]

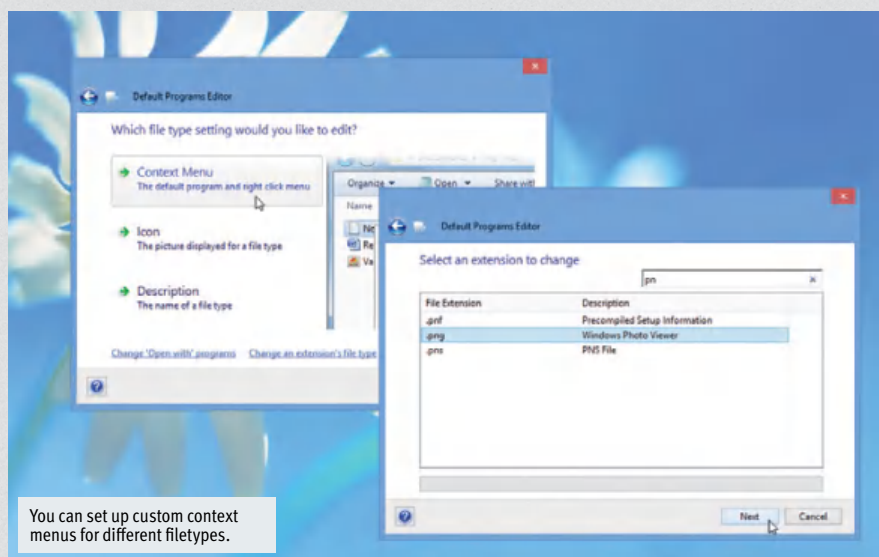
My battery doesn't exist

I recently bought a Mid 2009 MacBook Pro. The machine has spent the last couple of years being used as a desktop replacement, always plugged into the mains adaptor. When I try to boot it from battery, nothing happens. If I check with System Information, it reports there is no battery installed. I have tried replacing the battery and resetting the SMC but this hasn't made any difference. Do I need to buy a new logic board?

[CIARIAN RUSSELL]

Luis Villazon replies: It might just be the battery sensor. An Apple Authorised Service Provider ought to be able to replace this for you, but it's actually not impossible to do yourself. If you are comfortable with opening the case of your MBP, there are normally a few replacement battery sensor parts on eBay for \$20-\$40. In fact, you may not even need a new sensor. I've seen cases where the sensor simply comes loose and sometimes shows 100% charge and at other times 0%.

That's the best case scenario. At the other end of the scale, it's possible that you have a fault on the logic board itself (a dry solder joint or a cracked circuit board track that prevents the battery sensor from communicating with the SMC). There isn't any economical way to repair



that. You would have to resign yourself to keeping the MacBook Pro as mains-only machine or else sell it to someone else on that basis and get another one. Second-hand laptops are always a bit of a lottery.



[IOS]

Memo movement

I have a voice memo file I recently dictated to myself stored on my iPhone that's too big to email. How can I get this file off my phone and onto my Mac?

[JONTY VICKERS]

Matthew Bolton replies: You can use iTunes sync to transfer it. Connect your phone to your Mac (or PC) with the cable, and select it from the devices list in iTunes. Click the Music tab on the main panel and you see a box under 'Sync Music'

that says 'Include voice memos'. Tick that and sync your phone. This creates a new playlist in iTunes, called Voice Memos, with your file in it. You could also use a file transfer app such as iMazing (formerly DiskAid, from imazing.com).

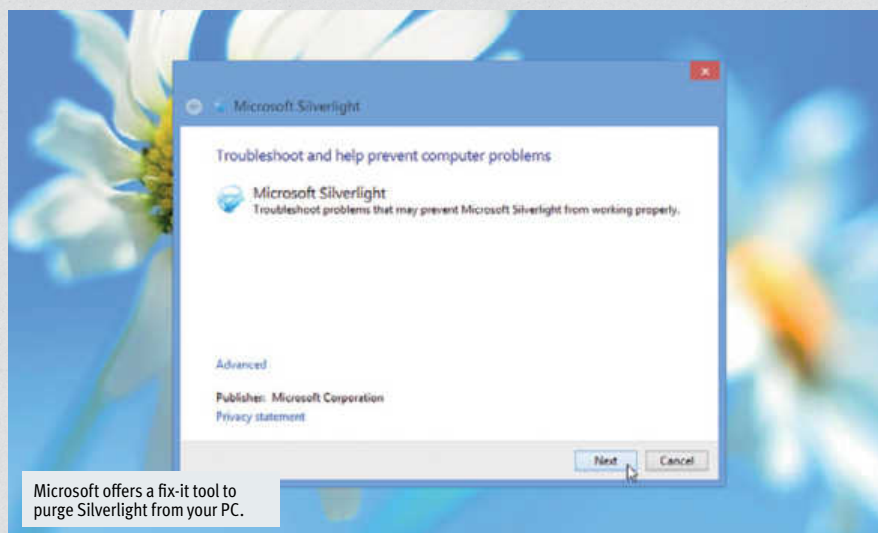


[NETWORKING]

Lost wireless printer connection

We have a HP Pavilion G6 PC and HP 4500 wireless printer. These have been working fine, but we seem to have lost the wireless connection between the two. We've uninstalled, removed everything, reconnected and then run the disc — everything seems to install smoothly, but when we try to print nothing happens. Are you able to help?

[MAX AND SUSAN GREEN]



Microsoft offers a fix-it tool to purge Silverlight from your PC.



You can grab large voice memos off your iPhone using iTunes Sync, or a third-party tool like iMazing.

Nick Odantzis replies: Max and Susan were able to confirm that another PC was still able to print to the printer wirelessly, which allowed us to focus our attention on the Pavilion G6 itself. Other HP users have reported fixing this problem by physically connecting the printer to the PC using a USB cable. Once the PC's detected the printer via USB, you should be able to disconnect the printer and try printing wirelessly again. Unfortunately Max and Susan haven't yet responded to this suggestion of ours, so we can't confirm whether or not it resolved their problem — please do let us know when a solution has been found, so we can share the method with other Windows users.

Nick Peers replies: The feature was removed from Vista. If the new 'Open with' menu isn't to your taste — John wanted a simple, one-click alternative to the default option, for example — then follow these steps.

- 01 Go to defaultprogramseeditor.com and download Default Programs Editor.

Right-click the downloaded file (DefaultProgramsEditor.zip) and choose Extract



[WINDOWS]

Add custom 'Open with' menu

What happened to the File Types tab in Folder Options? I want to add a custom 'Open in' option to the menu that appears when a PNG file is right-clicked.

[JOHN ROSTRON]



Temporarily plugging in your wireless printer via USB can sometimes solve Wi-Fi access problems.

All. Open the newly created folder and launch Default Programs Editor.exe.

02 When prompted for which settings to edit, choose 'File Type Settings'. At the next screen, click 'Context Menu' to edit the contents of a file type's context menu, then scroll through the list (or use the search tool) to locate the file type.

03 You'll see a list of existing context menu entries — click the 'Add...' button to create a new one from scratch. Next, type the command name (as it'll appear in the context menu), then click Browse to select your particular target program.

04 Click the expand button next to Advanced Settings. Set 'Item scope' to 'Only this extension (.png)', then click Next. You should see the option appear in the list — click 'Save Context Menu' followed by OK and Close to finish.



[INTERNET]

Silverlight update problem

I've been plagued by a failed Windows Update — one that attempts to update Silverlight. It's gone on for months, so in the end I attempted to uninstall Silverlight only to be told the feature I'm trying to use is unavailable.

[THERESA UNWIN]

Graham Barlow replies: Thankfully there's a simple solution to this irritating problem — Microsoft provides a handy Silverlight clean-up tool that will enable you to completely remove all existing traces of the software. You'll find this tool at support.microsoft.com/kb/2608523 — scroll down the page and click the Microsoft FixIt button. If prompted, you should choose to open it with the Diagnostics Troubleshooting Wizard. Alternatively you could save it to your hard drive and double-click Silverlight.diagcab to run it manually. Follow the wizard through and it should result in Silverlight being finally purged from your system. A little lower on the same web page you will find a link to the latest version and, hopefully, once this is installed, Windows Update will deliver future updates without any further problems. ■

[WINDOWS]

Make your own Windows tiles

CREATING TILES FOR YOUR FAVOURITE PROGRAMS AND SITES CAN TRANSFORM YOUR WINDOWS START SCREEN.

[MATT HANSON]

THE START SCREEN in Windows 8 and Windows 8.1 is one of the biggest changes in Windows' yet, and there's plenty you can do to customise it. For example, pinning your most used programs, games and applications to the Start Screen gives you quick access to them — all you need to do is press the Windows key on your keyboard, or tap the Windows icon on your touchscreen device, and they will appear.

However, although many Microsoft apps and ones you've installed from the Windows Store have attractive tiles that appear on the Start Screen, most apps don't, so you're left with a bunch of tiles that feature a small icon in the middle. Functional, but not very attractive.

But there's a solution that allows you to create your own tiles to pretty up Windows 8. It's called OblyTile and here's how to use it.

[STEP BY STEP]

TRANSFORM YOUR START SCREEN WITH OBLYTILE



01

DOWNLOAD OBLYTILE

Download the OblyTile program from tinyurl.com/cpoxlet and scroll down to where it says 'Download from'. Click on 'OblyTile v0.9.9.exe' (the version number might be slightly different) and select Download. A pop up will ask you where you want to save the download, which can be in your Downloads folder, or somewhere you can easily find the program.



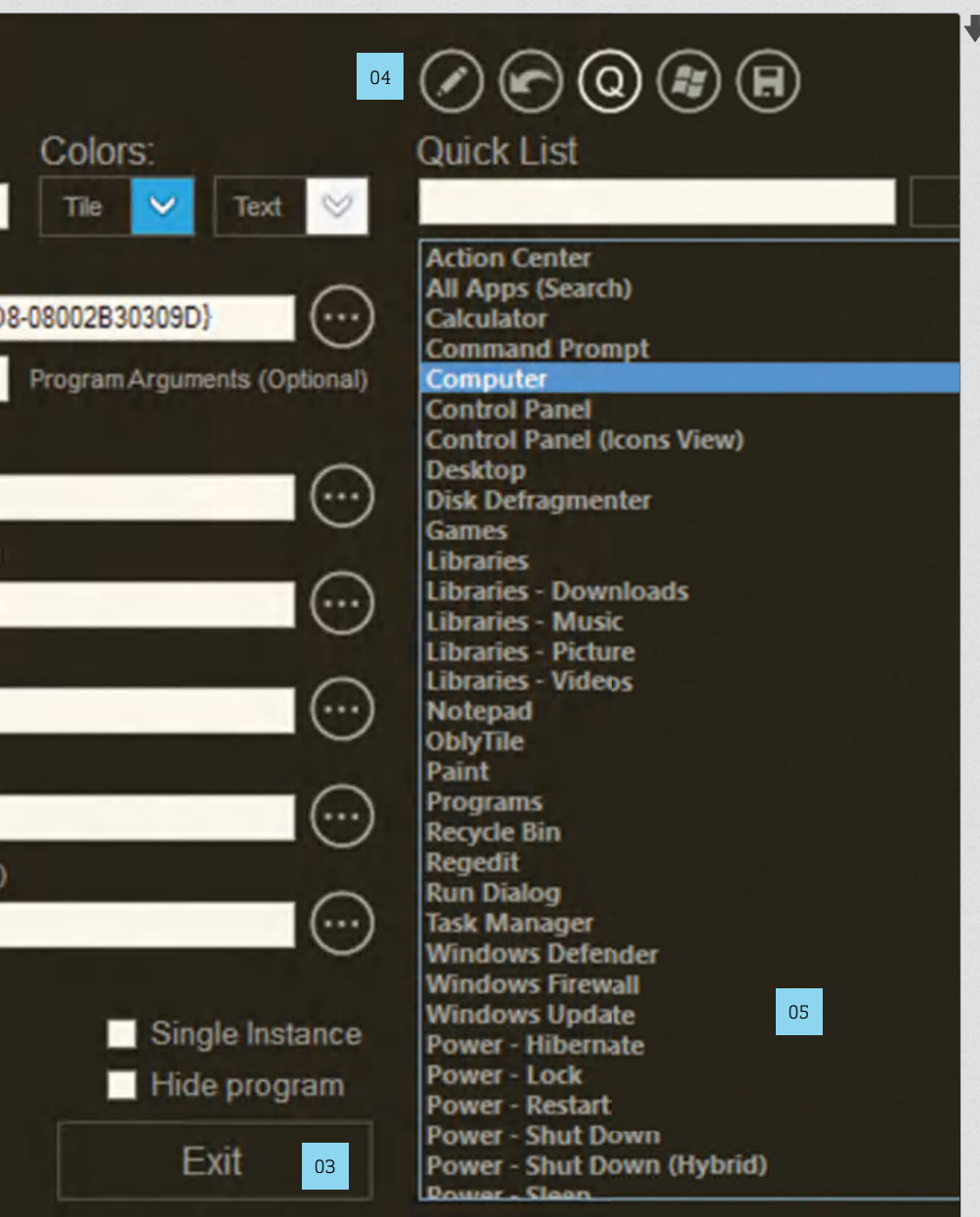
01

02

02

RUN OBLYTILE

There's no installation process for OblyTile, all you need to do is open Windows Explorer and navigate to the folder where you downloaded it. If you did not specify a location in the previous step, then it will most likely be saved in your Download folder. Once you have located the program (called OblyTile.exe), double click it to launch.



01 TILE PREVIEW

Here you can see what your tile will look like in various shapes and sizes. You only need to add one image to turn into a tile, but if the image looks odd in certain sizes you can add others

02 NEW TILE

Click this icon to create a new tile. It will clear the existing tile, so save before you begin a new one.

03 TILE SETTINGS

This is where you can tweak advanced settings for your tile, for example making the program run as administrator when you click it.

04 TOOLBAR

These icons give you access to various OblyTile tools. The first one lets you edit any tiles you've previously made. The next one automatically turns shortcuts of your apps into tiles. The 'Quick List' tool provides ready-made tiles for popular apps, while the Windows Apps tool lets you change tiles for Windows apps.

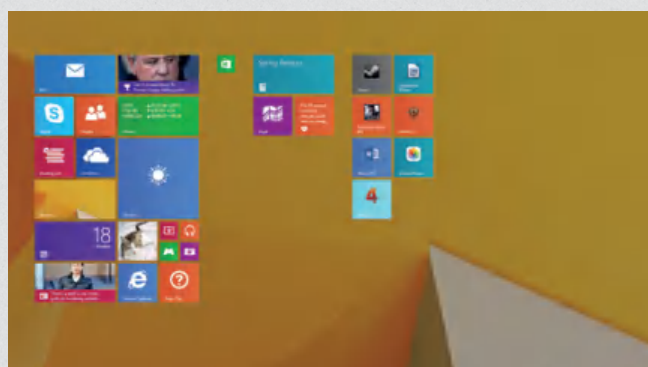
05 IMPORT OR EXPORT

Click this button to import or export your tiles. This is handy if you have a number of PCs and don't want to go through making tiles for each machine.



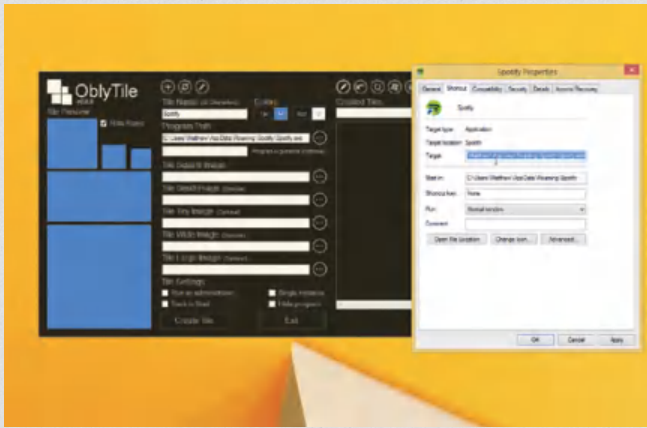
03 NAME THE TILE

Now you can create the tile for the program you want to run. In the 'Tile Name' text box, enter in the name of the program. If you would prefer the name to not appear on the tile, click on the box where it says 'Hide Name' to prevent the tile from displaying it. This is helpful if you have artwork on the tile that will clash with the text.



04 ENTER THE PROGRAM'S PATH: PART ONE

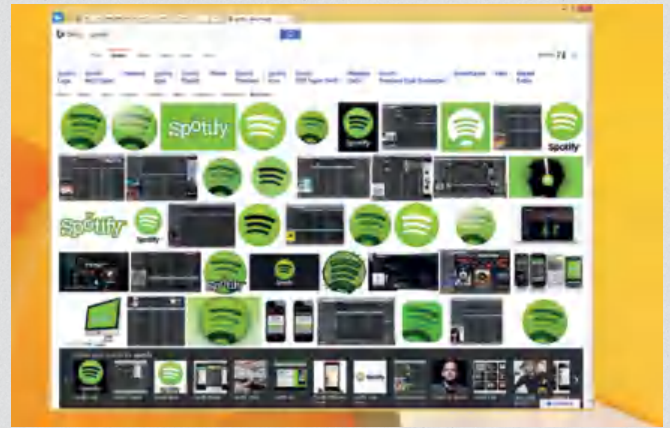
You'll need to point OblyTile to where your program is installed on your hard drive. If you know the location you can type it in here, or use Windows Explorer to find it. An easier method is to open up your Start Screen by pressing the Windows button, and typing in the name of the program. Right-click the name of the program and select 'Open file location'.



05

ENTER THE PROGRAM'S PATH: PART TWO

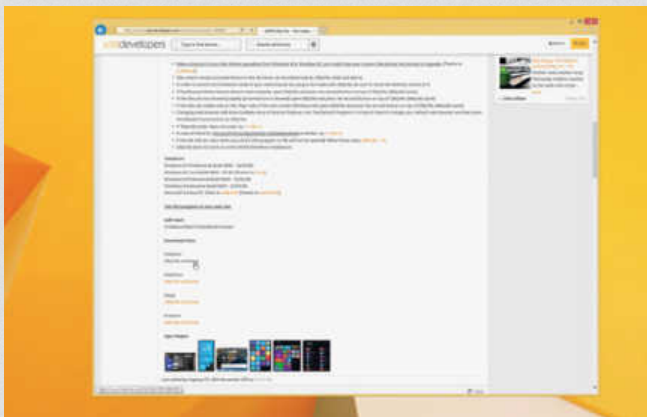
Most of the time the 'Open file location' points you in the direction of the program's shortcut, not the program itself. To get the location of the program, right-click the short cut and select Properties. In the Target text box, select all the text, right-click and select Copy. Now go back to OblyTile, right-click the 'Program Path' text box and select Paste.



06

CHOOSE THE TILE IMAGE: PART ONE

Now for the fun part. To make your Start Screen look attractive you can select an image to use as the background of your tile. This can be an image you've created yourself in a program such as Photoshop, or one you've downloaded from the internet. Using the image search function of Google or Bing can help you find the artwork you're after.



07

CHOOSE THE TILE IMAGE: PART TWO

If you're after even more tiles, then head over to tinyurl.com/d8qaegg. This is a huge collection of icons for programs that you can use with OblyTile. Download the tiles (or any images) and in OblyTile click the button with '...' next to the 'Title Square Image' to open Windows Explorer and browse to the image you want to use.



08

TWEAK YOUR TILE

You'll now see previews of your tiles. As Windows 8 allows you to change the size of tiles you can choose to display a different image if you want to make the tile wide for example. OblyTile also detects the background colour for you, but if you want to change that, select the drop down box titled Tile under where it says 'Colours:'. You can also change the text colour as well.



09

ADVANCED OPTIONS

You can also select advanced options to tweak how the program performs when you click on its tile. If you know how to use program arguments enter them in below the program path (for example typing `/fullscreen` forces the program to open in full screen). You can also tick boxes to make the program run as administrator, or hide the program, so it runs in the background.



10

CREATE THE TILE

Now you're pretty much done, all you need to do is click 'Create Tile', select the size and OblyTile will add it to your Start Screen! Clicking the tile will open the program, making it quick and easy to launch your favourite apps. You can do the same for web sites as well — just add the web address into where it says 'Program Path' ■



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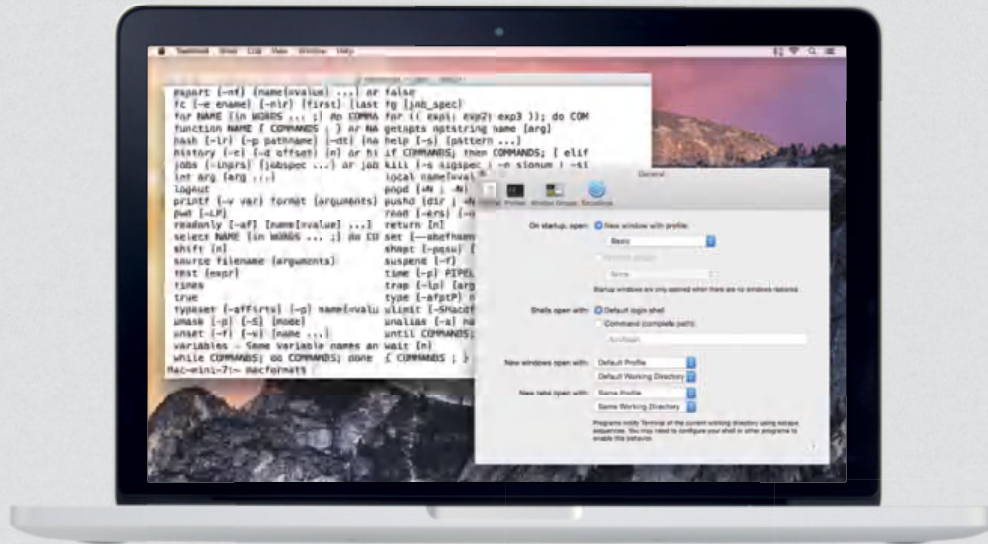
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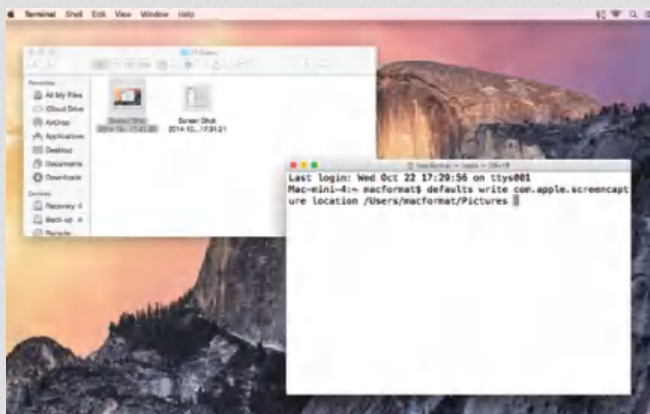
[MAC]

Do more with OS X's Terminal

DON'T BE AFRAID OF THE COMMAND LINE — PUT ITS POWER TO GOOD USE!

[CRAIG GRANNELL]

THERE WAS A time when all computers were controlled using a command line — you typed in strings of characters to make your machine do something. The Mac's graphical interface superseded this way of working (for good reason), but in fact the command line lives on as a way the technically minded can often perform certain tasks more quickly than with a graphical interface; it's also frequently a means by which to activate hidden settings that Apple has decided not to enable general access to. You can use it with a utility called Terminal which can be found in Utilities within the Applications folder; open it and you see a text-based prompt. At this point, it's not obvious what to do, but you can view a huge list of commands at ss64.com/osx, or type `man` and a command (for example, `man ls`) and hit Enter to access documentation. Type `q` to return to the command line at any point.



01

CHANGE GRABS' SAVE LOCATION

By default, screenshots are saved to your desktop. A better bet is to stash them somewhere else, such as in your Pictures folder. To do this, enter `defaults write com.apple.screencapture location /Users/your username/Pictures;` `killall SystemUIServer.`

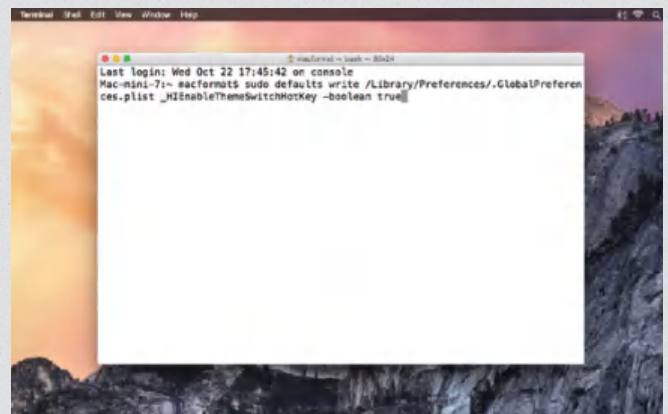


GET THE LOOK

By default, Terminal uses 11pt Menlo Regular for its font. This can be altered in the Profiles tab of its preferences, which provides alternative, predefined colour themes and the ability to create and save your own.

JARGON BUSTER

A command line interface enables you to interact with a computer by typing in various text-based commands. These generally consist of the command itself plus parameters to control or modify exactly what it does.



02

CREATE A DARK MODE SHORTCUT

Like Yosemite's dark mode, but not activating it in System Preferences? Use `sudo defaults write /Library/Preferences/.GlobalPreferences.plist _HIEnableThemeSwitchHotKey -boolean true`, log out and log in again. Toggle dark mode with Command-Control-Option-T.

[ANDROID]

Using a VPN on Android

TAKE BACK YOUR PRIVACY AND AVOID METADATA RETENTION WHILE SURFING THE WEB.

[SIMON CHESTER]

WHAT WITH THE introduction of mandatory metadata retention laws for ISPs, it's fast becoming common practice for Australian digital citizens to employ VPNs — that is, virtual private networks — to conceal their online tracks from Big Brandis and Uncle Sam. It's not that I or other concerned citizens have anything to hide, it's just that other people don't have the right to log, view, and make judgement on every single thing I do online.

Even if you don't think that the government will have any interest in what you're doing online, if you use your phone at internet cafes or Wi-Fi hotspots, a VPN is a great way to protect you from users on the same network that may have intentions that are less than pure.

Further, if you're connecting to an open Wi-Fi network (one that you don't type in a password to initially connect to), almost all of your data is out there floating on the airwaves, ready to be snapped up by any machine nearby.

With financial incentives for unsavoury characters to run packet-sniffing apps, you'd be foolish to think that any free Wi-Fi network available to you while travelling is just as safe as

your network at home. Thankfully, setting up a VPN connection on Android is an easy task, but there are still a few considerations that you need to make when doing so, which I will guide you through now.

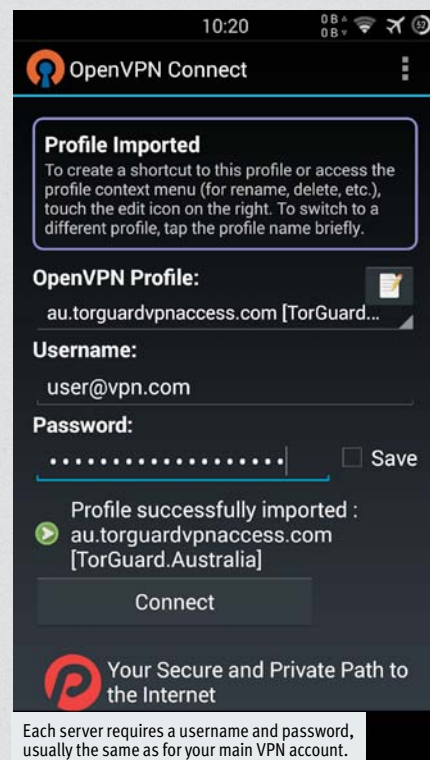
Before I get ahead of myself, though, I'll quickly walk you through just what a VPN is, and how it protects your privacy online.

A VP WUT?

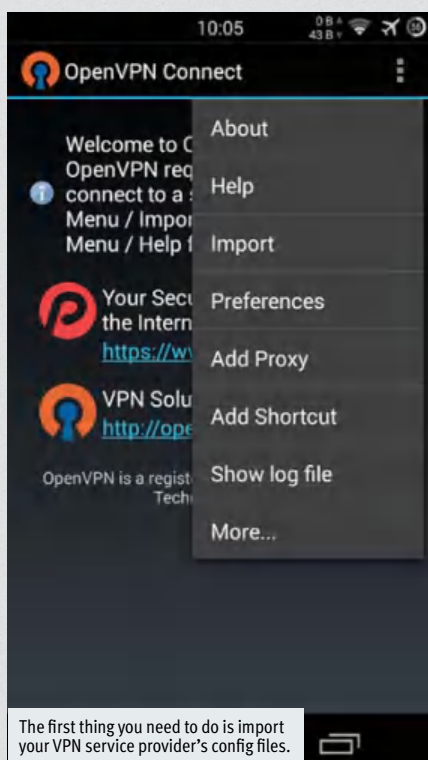
A VPN allows you to create a private connection over a public one. This sounds like nothing too special, but what it does is actually allow you to route everything you send over your network through to a trusted server via a secret, encrypted tunnel — keeping it away from prying eyes.

Additionally, you can use VPNs to access the internet as if you're located somewhere that you're not, which is very handy if you're looking to stream Netflix or something similar, or otherwise bypass any web site blockages or other filtering mandated by your local totalitarian regime.

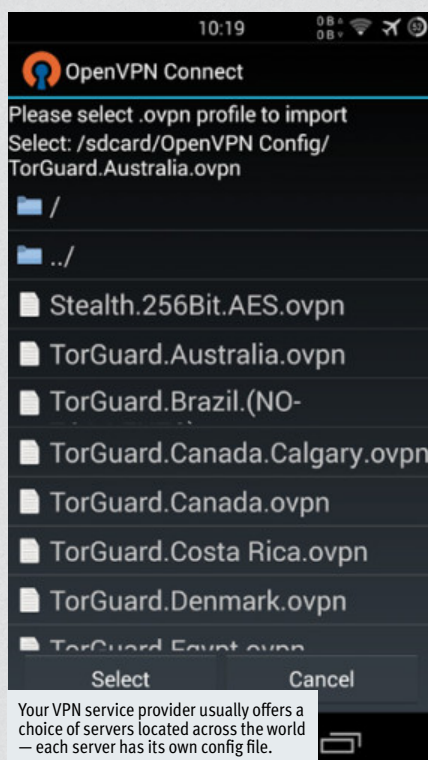
Not all VPN connections are the same



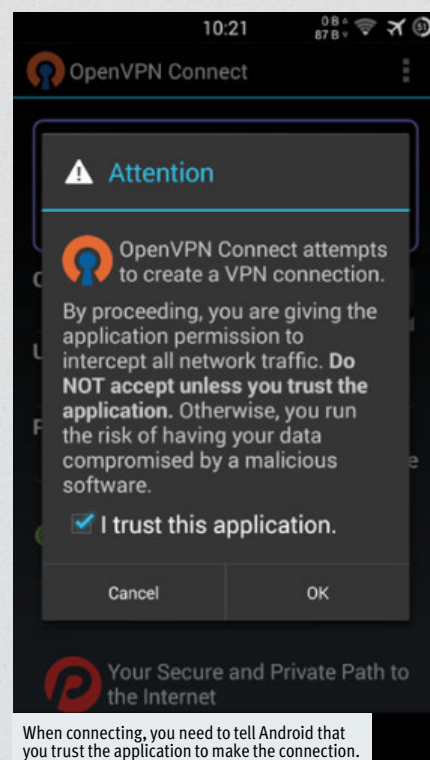
Each server requires a username and password, usually the same as for your main VPN account.



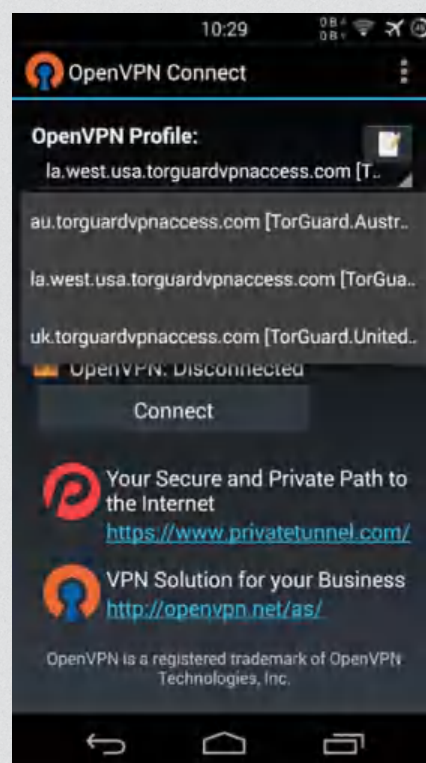
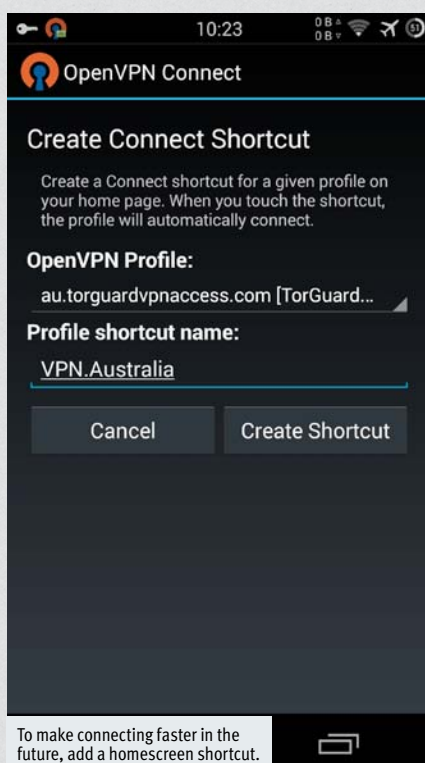
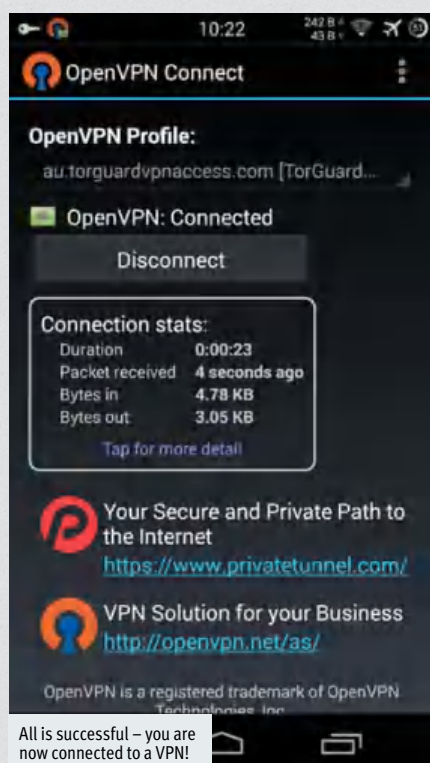
The first thing you need to do is import your VPN service provider's config files.



Your VPN service provider usually offers a choice of servers located across the world — each server has its own config file.



When connecting, you need to tell Android that you trust the application to make the connection.



quality, however, and when looking for providers you'll see connections available using many technologies, including PPTP, L2TP, IPsec, OpenVPN, and more. Above all others, I recommend OpenVPN, as it has

stood up to the most scrutiny, and is easier to implement than some of the others. It's also open source, which always makes me happy.

CHOOSING A VPN PROVIDER

So, now that I've convinced you of the merits of a VPN, you will need to choose one to connect to. You can peruse a list of VPN providers that take your privacy seriously at torrentfreak.com/anonymous-vpn-service-provider-review-2015-150228/.

I hesitate to recommend any one provider in the above list over any other, as I haven't tried them all, but I do recommend looking for one that includes either its own Android client, or that provides config files for the official OpenVPN client for Android, as it will save you a lot

"YOU CAN USE VPNs TO ACCESS THE INTERNET AS IF YOU'RE LOCATED SOMEWHERE THAT YOU'RE NOT, WHICH IS VERY HANDY IF YOU'RE LOOKING TO STREAM NETFLIX OR SOMETHING SIMILAR."

of fiddlin'. Of course, you're not going to use the VPN exclusively on your Android phone, either, so make sure they have access for multiple devices, and provide clients for every platform you're interested in (e.g. iOS, Windows, Mac etc).

For this guide, I'll show you how to set up a VPN for your chosen service provider using the official OpenVPN client rather than the native VPN support introduced in Ice Cream Sandwich, which doesn't support OpenVPN, the gold standard for VPN connections. You can connect to other VPN types (PPTP, L2TP, and IPsec) under 'Android Settings > Wireless and Networks (> More) > VPN'.

SETTING UP A VPN

So, first things first, visit the Play Store and download the official (and free) 'OpenVPN Connect' client (that's the one published by OpenVPN).

You'll next need the OpenVPN config files available from your VPN provider. If these are

provided as a zip file, you'll have to extract it so that you have files with the extension '.ovpn'.

Place those files into a folder on your phone's storage, then, from the OpenVPN app's three-dot menu, choose 'Import Profile from SD card', and navigate to the folder that you placed those config files in, finally selecting the server that you wish to connect to.

So, which one should you choose? It's up to you — are you looking to access content blocked in your country? Then choose a country that does have access to that content. If you're not interested in location spoofs, then for the sake of access speed, choose the server closest to your current location.

Once you've imported a profile, you'll need to enter the username and password given to you by your VPN provider. I'd tick the 'save' box, so that the next time you connect, it will be a faster process. Connecting — both now and next time — is just a matter of tapping the Connect button from the main screen, and telling Android that you trust OpenVPN to make a VPN connection for you.

If you've imported multiple OpenVPN server connections, then you can quickly choose between them from the drop-down menu up the top of the main screen, making it a breeze to switch between countries.

To make accessing the VPNs even faster, you can add shortcuts to your Android homescreen. To do so, choose 'Add Shortcut > Add Connect Shortcut' from the three dot menu, then select from the drop-down menu which connection you want as a shortcut, give it a name — et voilà; you're just one press away from more secure browsing. ■

ONLY PARTLY ANONYMOUS

Keep in mind that VPNs only encrypt your traffic up to their endpoint — the server that you chose in the connection process. Your internet activity can be monitored from this point onwards, so don't think that you no longer have to rely on SSL for banking or online shopping etc. Additionally, all your online activity will be tied to the IP address assigned by this server. Most VPN providers share IP addresses, so there's no way to definitively single you out for any criminal activity undertaken by your assigned IP address, but don't think that a VPN is a free pass to illicit town.

[iOS]

Master iCloud on iOS

BACK UP YOUR IPAD AND SYNC WITH OTHER DEVICES VIA APPLE'S SERVERS.



DO YOU USE an iPhone in addition to an iPad? Are you also using a Mac or a Windows PC? In any of these cases, or even if you're using just an iPad on its own, you can make use of iCloud, Apple's free cloud-based sync, backup and file storage service.

To put it simply, iCloud enables you to sync your music and movies — plus your photos, contacts, calendars and various kinds of data — wirelessly to the cloud. This means they're all stored on Apple's online servers and are then available on any compatible devices.

How does it work? First, you need to be using the latest versions of iOS and OS X (and there's also a handy Windows desktop tool and iCloud control panel if you use a PC instead of a Mac — find it at support.apple.com/en-us/HT204283). To sign up for the service, you'll need an Apple ID.

Then you simply enable iCloud and choose which types of files and data you want to sync: contacts, calendars, reminders, notes, bookmarks, mail account settings (your email

messages too if you opt to set up an iCloud Mail account) and more. Now instead of backing up to your Mac or PC via iTunes, your device will sync with iCloud over Wi-Fi, even if you plug it manually into your computer using a cable.

GETTING INTO SYNC

Part of the service is iTunes in the Cloud, which enables you to wirelessly download all your purchased iTunes music and movies to any or all of your devices. The same goes for App Store and iBook Store purchases.

Next is iCloud Photo Library, which syncs your photos: take a snap on your iPhone, and it is automatically available on your Mac and all your other iCloud-linked devices. All your shots are stored in iCloud Photo Library, so you get the complete collection wherever you are — provided you have enough space in your iCloud storage for them all. You get 5GB of storage by default, but can upgrade, as we'll explain below.

You can also sync your web browser bookmarks, and adding items to your Reading

List on one device means they'll then appear in the Reading List in Safari on all your other devices linked to the same iCloud account. You can also see what tabs you have open in Safari on your other devices, and open them with a tap or click on any other device.

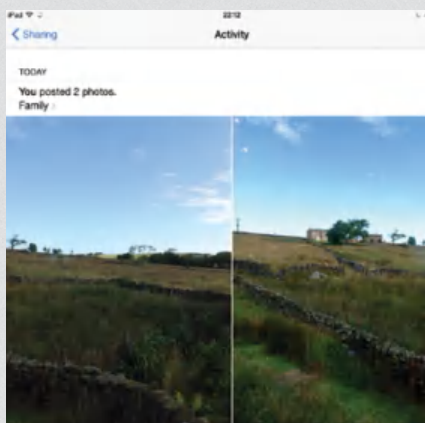
iCloud can even sync playback: if you start to play a movie, TV show, podcast or audio book on one device and then pick up another, it will resume playing from the point where you left off on the first device. This works for content bought or rented from Apple, and also for your own movies stored locally.

Finally, there's iCloud Drive (formerly iCloud Storage). This also uses your free 5GB of storage, in this case for backing up your documents and data (but your music, apps or other purchases don't count towards the quota). If you need more you can pay for it with a monthly subscription — from 20GB to 1TB extra — but be aware that the prices jump rather sharply as capacity rises. The 20GB option is only \$1.29 a month, however.

[STEP BY STEP]

HOW TO SHARE VIA iCLOUD

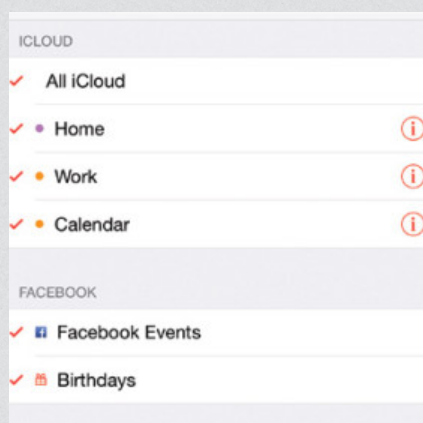
ACCESS EVERYTHING, EVERYWHERE.



01

SHARE PHOTOS

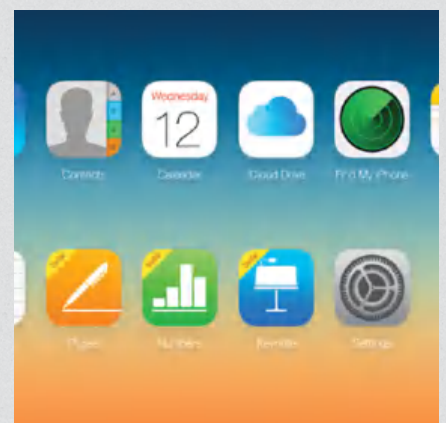
In the Photos app you can create a shared photo album and invite people to it. Once they accept, they can view the album, comment and, if they're using the latest iOS and you allow this, add their own content. You can also make the album public on icloud.com.



02

SHARE CALENDARS

In the iOS Calendar app, tap Calendars at the foot of the screen, tap the 'i' beside an iCloud calendar, and tap Add Person to invite someone to share the calendar. Scroll down and switch on Public for a link to email to anyone you want to be able to view (but not edit) the calendar.



03

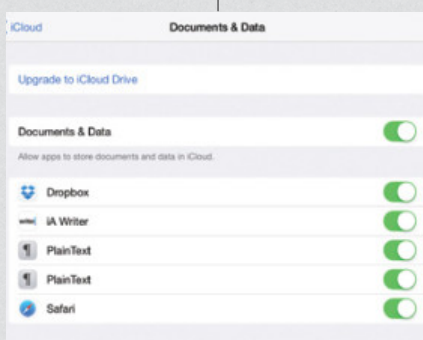
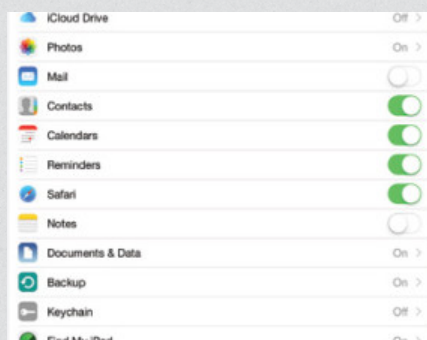
SHARE DOCUMENTS

With iWork in the Cloud, you can open and edit your files on the web at icloud.com — and so can other people using any supported browser, via links you send them. The site can also convert between iWork, Microsoft Office and PDF formats on upload or download.

[STEP BY STEP]

HOW TO MASTER YOUR ICLOUD BACK-UP SETTINGS

MAKE SURE ALL YOUR FILES ARE KEPT SAFE.



01

ICLOUD SETTINGS

Tap 'Settings > iCloud' and, if you didn't enable iCloud during setup, you can do so now. Decide which iCloud services you want to switch on. Choosing Mail won't sync all the email accounts you may access via the Mail app, only your free @icloud.com account.

02

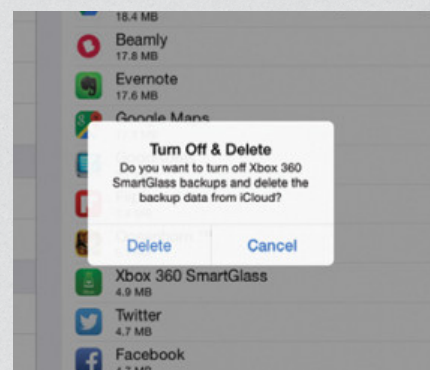
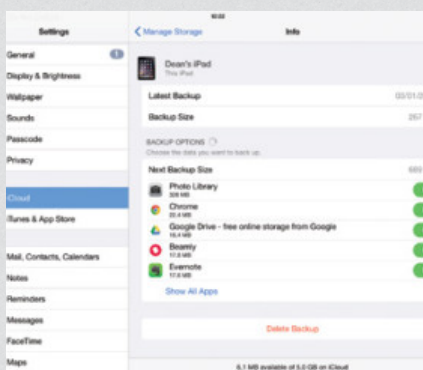
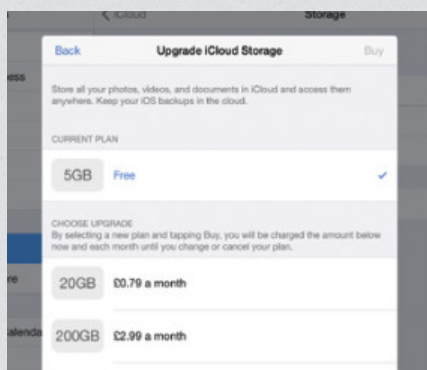
DOCUMENTS & DATA

Tap Documents & Data to enable your apps to use iCloud to store documents you create and other data such as saved games (you must not have used iCloud Drive yet). You can also choose whether it uses a Mobile (cellular) connection if Wi-Fi is not available.

03

STORAGE & BACKUP

To enable iCloud Backup, tap Storage & Backup and switch this on. Your iPhone will no longer sync and back up automatically to iTunes. Instead, it will back up to iCloud when switched on and connected to Wi-Fi. You can also tap Back Up Now to back up manually.



04

BUY MORE STORAGE?

Tap 'iCloud > Storage > Manage Storage > Change Storage Plan'. You still get 5GB for free; if you need more, you can tap to select a new tariff (pay monthly) under 'Choose Upgrade'. An extra 20GB (making 25GB, including your initial free 5GB) is just \$1.29 per month.

05

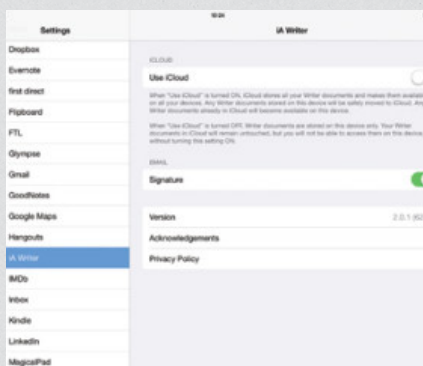
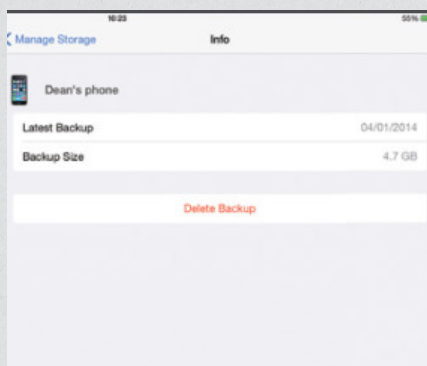
OR OPTIMISE FIRST

But do you really need more? On the Manage Storage screen you'll see your devices that use iCloud backup, as well as a summary of Documents & Data being stored in iCloud. Tap the name of this iPad to see details of what data on the device is being backed up.

06

SPECIFY BACKUPS

To save space and stop backing up items you don't really need, you can turn each app's backup on or off. Tap Show All Apps to see smaller apps. iOS apps store user data internally, so Photos contains all the photos you've shot, iBooks all the books you've bought, and so on.



07

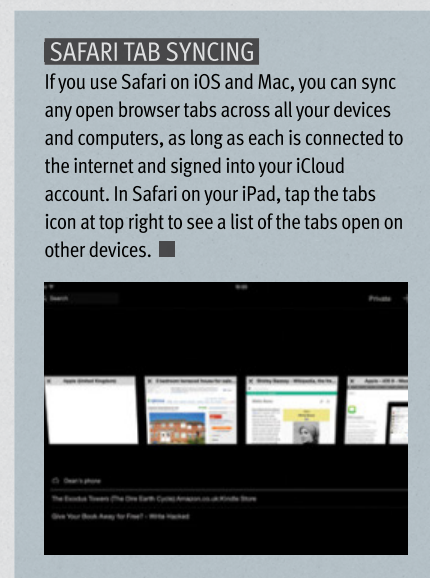
OTHER DEVICES

For devices other than the one you're using, you can't view this level of detail but you can see when it was last backed up and how big the backup is. You can also delete any device's backup, but think carefully before you do this, especially in the case of other devices!

08

ACTIVATE APPS

If you're using iMovie or any of the iLife apps (Pages, Numbers and Keynote), make sure to tap each one in Settings and enable iCloud there as well so that your documents are saved to iCloud, accessible at icloud.com and synced on all your linked computers and devices.

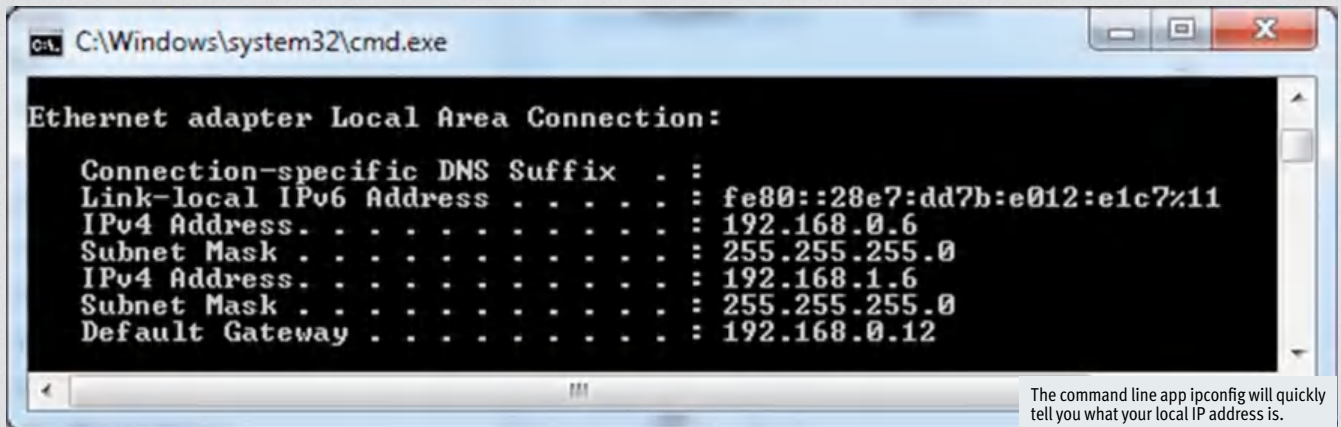


[DOWNLOADS & STREAMING]

Streaming media with VLC

THERE'S MUCH MORE TO VLC THAN MEETS THE EYE.

[NATHAN TAYLOR]



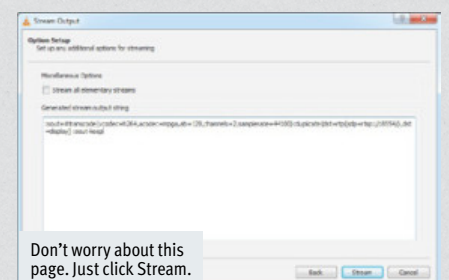
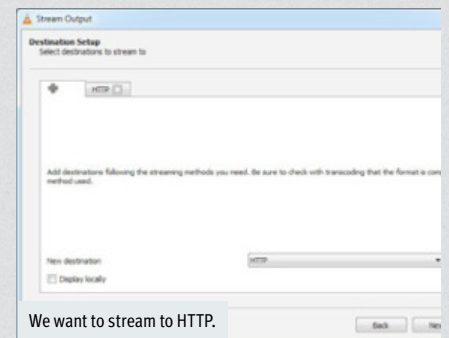
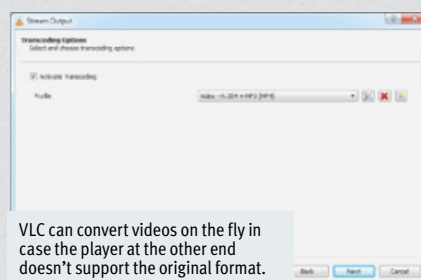
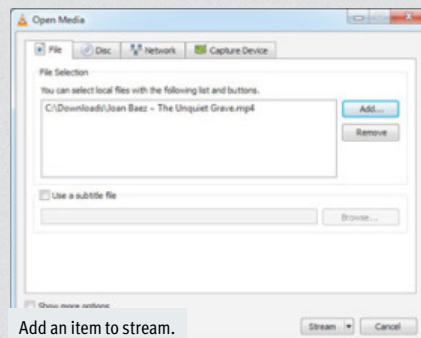
VLC IS PRETTY well known as a media player that's capable of playing just about anything. Experienced users, however, know that there's much more to the application: including the ability to stream media from one device to another. You can even stream your desktop or the input from any capture devices you might have in your system.

STREAMING VIDEOS FROM ONE DEVICE TO ANOTHER

We'll start by talking about VLC's most basic streaming function: streaming from one device with VLC installed to another device with VLC installed. VLC is available for all the major platforms (including iOS and Android), and you'll need it installed on both the device you'd like to stream from and any devices that you want to watch the stream on.

You'll also need to know the local IP address of the computer you're streaming from. If you don't know what it is, open up Windows search bar and type `cmd`, which will bring up the command prompt in Windows. In the command prompt, type `ipconfig` and look for your IPv4 address. We need to know this address so that we can connect to it from the client devices. Once you've done that, we can begin:

- 01 Open up VLC on the device you'll be streaming from. Click on 'Media > Stream' (or just press Ctrl-S). The open/stream media dialogue will open up.
- 02 Next click on the Add button, and select a video file you'd like to stream.



Click on the Stream button at the bottom when you're done.

03 The Stream Output window will appear, with the source already selected. Just click Next.

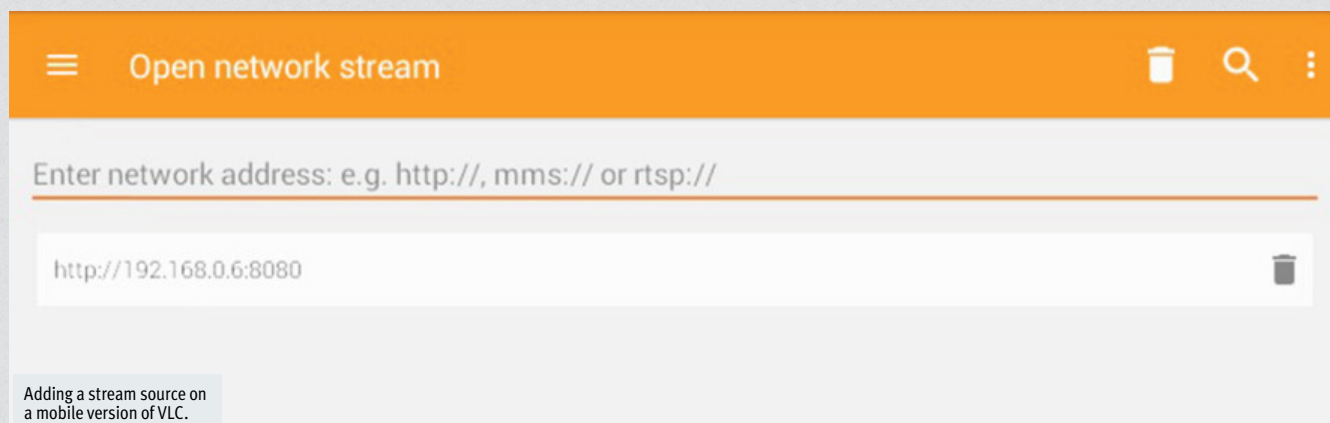
04 The Destination window will pop up. From the New Destination menu, select HTTP, then click on Add.

A new tab will open up for HTTP. Note the port number — 8080 by default.

If you go back to the first tab, you can actually add additional destinations; VLC lets

you stream to multiple targets at once if you like. You can also check the box for Display Locally, which will have VLC display the video on the source PC as it streams it. Click Next when you're done.

05 The transcoding options box will appear. VLC will convert the video on the fly to a new format. It does this in case the target device is not capable of playing the video being streamed. If you're streaming VLC to VLC, that theoretically shouldn't be necessary since if this VLC can play the video then the other one



“ESSENTIALLY WHAT YOU DO ON THE STREAMING PC IS REFLECTED ON THE PLAYING DEVICES IN REAL TIME.”

should be as well — so you can uncheck the Activate Transcoding box if you like. Whichever you choose, click Next.

06 There's a final confirmation window showing you the text string it will be using for streaming. You can just click Stream to start the streaming.

The file will start streaming. If you chose Display Locally in step 4, the VLC window will have the video shown in it. If not, the progress bar will move, but you won't see the video on screen.

07 Now head to the device(s) you want to watch the stream on and fire up VLC. As many devices as your processor and bandwidth can support at once can view the stream.

08 On a mobile, tap on the Stream option. On a PC, click on 'Media > Open Network Stream'.

You'll be given a bar into which to type the address from which to stream. Tap or click on it and type in: `http://<ip address>:8080`

Where <ip address> is the local IP address of the device that's streaming the video.

On a mobile, VLC will actually remember previously typed addresses, so you only need to enter them once and can just tap on them in the future to resume streaming from the device. On a PC, an added stream will appear in the playlist. Select it and press play to view the stream. Because it's a live stream (rather than a transferred file) your play controls will be limited on the client; you can't, for example,



OTHER APPS

Technically you don't need VLC on the client devices (the ones you're planning to view the video on). VLC actually supports open standards for streaming including streaming over HTTP and RTSP. In Kodi, for example, you can set up a source with the HTTP or RTSP protocol. So you could stream from your desktop PC to a device (like the OSMC Raspberry Pi we talked about last month) running Kodi alone. You just need to add a new video source in Kodi, with HTTP or RTSP (whichever you use in VLC) as the protocol and the IP address and port number of the VLC PC as the source.

fast forward and rewind — though you could do that on the source PC by moving the slider bar across.

09 On the source PC, you'll notice that any streams you add will be added to the live playlist (which can be saved, just like a normal playlist). You can add more streams, restart streams, control the playback position or start streaming something else by double clicking on it. Essentially what you do on the streaming PC is reflected on the playing devices in real time. You've essentially become a live broadcaster!

10 Now that you've got basic streaming down, you can experiment with more complex streaming. By going to Capture

Devices in your Stream dialogue, you can see that you can actually live stream from a capture source on your PC — a webcam or capture device for example. You can also broadcast your PC's desktop (although that's a little flaky at the moment — we had continual crashes when we tried). Technically you can even broadcast the input from a TV tuner, though the implementation of that is extremely technical and not for the faint of heart. ■

[SECURITY AND PRIVACY]

Slipping through site blockades

HOW TO JUMP THE NET HURDLES.

[NATHAN TAYLOR]

THANKS TO THE new Copyright Amendment (Online Infringement) Bill 2015, Australia has joined the ranks of countries that restrict internet access to selected sites. It's a phenomenon that's already common in Europe — and it's also extremely easy to get around.

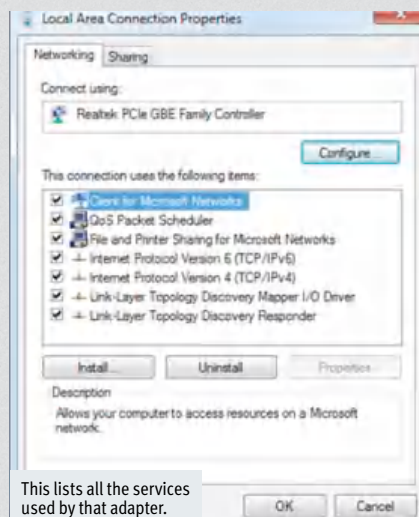
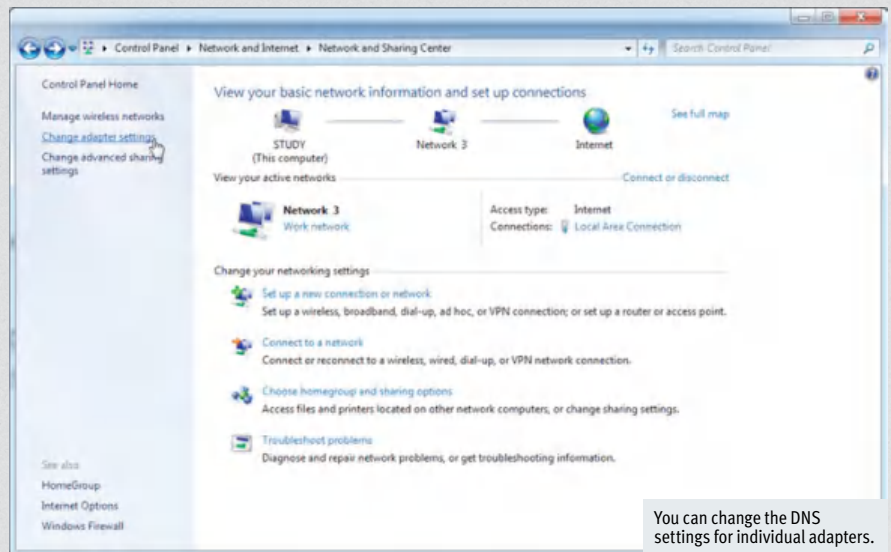
The new Bill requires that Australian ISPs block user access to sites on a government blacklist. Companies can pursue legal action to get specific sites added to the blacklist, so you can be sure that major file sharing sites are going to be quickly added.

The Bill, however, is not clear on how the ISP should implement site blocking. There are a number of options for ISPs, from deep packet inspection to IP address blocking to DNS manipulation. Based on the European experience with similar site blocks, the following types of blocks will likely be implemented:

01 DNS poisoning is the most commonly used solution, and the most easily counteracted. DNS is the directory system that converts readable addresses like **www.google.com** into the numerical IP addresses that can be actually used to navigate the internet. To implement a block, the ISP simply modifies its DNS tables so that when you try and access a blocked site, instead of reporting the real site IP address, it reports 0.0.0.0, so that your browser can't figure out where to go. The first method below deals with this basic level of site blocking (as does the second and third method).

02 IP address blocks. The ISP actively firewalls all traffic going to and from a particular IP address. This can be effective at stopping access to a site, but historically it has had problems with "innocent" sites being caught up in the dragnet. Sites often share IP addresses (because they're on the same server or network), so many sites other than the targeted one can potentially be blocked. The second and third method below will bypass IP address blocks.

03 Deep packet inspection. This is where the ISP looks inside your data to see where the traffic is going and what content it



contains and will block any data destined for a restricted site or service. Given its cost and the potential to slow down internet connections, not many ISPs have historically implemented this for simple site blocking — it tends to be used more in corporate environments and for sophisticated service blocking (like blocking all BitTorrent traffic). Methods two and three below will defeat it.

Three ways of dealing with sites blocks

01 THE DNS SOLUTION

If your provider implements DNS poisoning, the workaround is extremely simple: use somebody else's DNS server.

When you connect to your ISP, the ISP will give your router a DNS address to use for lookups. The router in turn will give that same DNS address to devices that connect to it, or give its own address so that the devices can use the router as a proxy. Either way, configuring

devices to use a third party DNS server is extremely easy.

In Windows, you can go into the Control Panel and head to the 'Network and Internet > Network and Sharing Center'. On the left side, click on Change adapter settings.

This will bring up your list of wired and wireless adapters. Right click on the one you want to change and select Properties. This brings up the services window for that adapter.

Click on Internet Protocol Version 4 (TCP/IPv4) then click on Properties. A new window will pop up showing you the IP settings for that adapter. In most cases it will be automatic for both the IP address and DNS server. Let's not make it automatic for the DNS server. Click on the 'Use the following DNS server address' radio button. Then type these two numbers into the Preferred and Alternate DNS server fields before clicking on OK:

8.8.8.8
8.8.4.4

OTHER METHODS

Our list here is hardly exhaustive. There are many, many other ways to defeat site blockade: using the Tor browser (www.torproject.org), modifying your HOSTS files, using the Freenet Project (freenetproject.org), anti-censorship browser add-ons, web-to-email services like www.web2mail.com and mirrors and archive sites like the many Pirate Bay mirrors.

These are the IP addresses of Google's public DNS servers. So instead of asking your ISP what the IP address of the site you're visiting is, your computer will ask Google instead, which is under no obligation to block sites. There are other third party DNS servers around: OpenDNS (www.opendns.com), Norton ConnectSafe (connectsafe.norton.com) and dozens more, but Google is fast and simple.

Once you've done that, you should be able to access blocked sites easily.

Other devices can be similarly set up if you go into their advanced network settings. You can also configure your router to use it: instead of delivering the ISP's DNS server to client, it can deliver the third party DNS instead.

Configuring that depends on the router model, but in general you want to look for either the router's own DNS settings in the WAN or LAN configuration or the DHCP settings (which tells the router what DNS server to give to devices connecting to it).

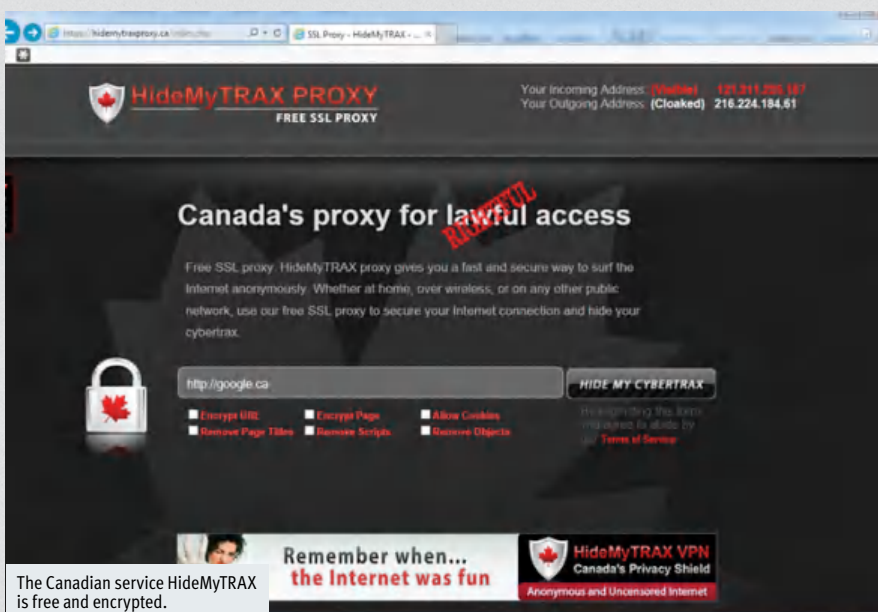
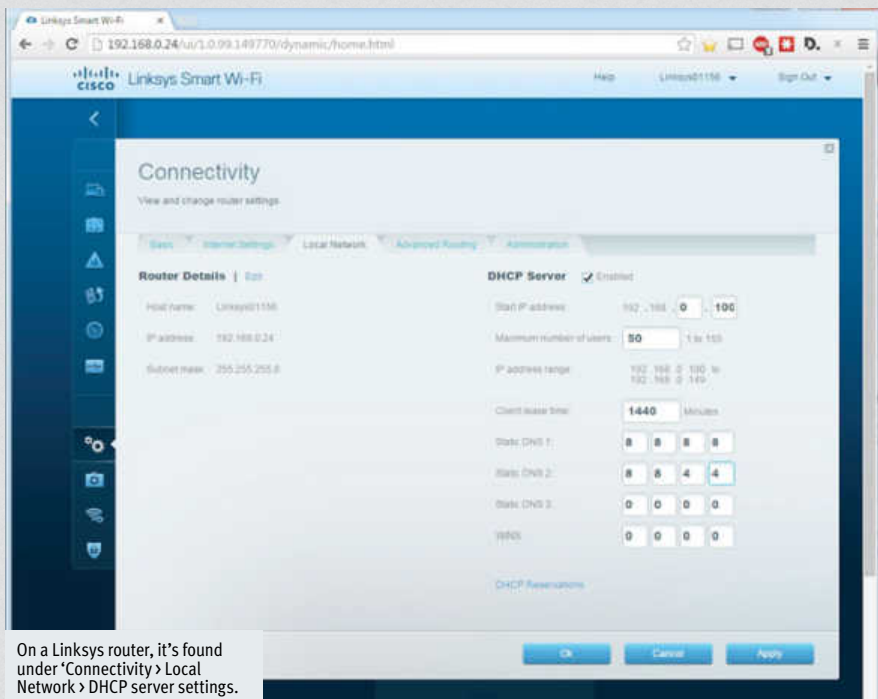
02 USE A VPN SERVICE

Truly, we don't need to say much about this at all. A VPN service defeats all the methods by which an ISP might block your connection to specific web sites. The VPN service provider will provide you with a new DNS server when you connect, so DNS poisoning won't work. The only IP address your ISP can see you accessing is that of the VPN provider, so IP address blocks won't work. All data sent between you and VPN provider is encrypted, so deep packet inspection is foiled.

You just need to make sure that when you choose a location to connect from, it's one outside of Australia (or any other country that might have legislation for blocking the site you want to connect to). The US is usually a safe choice.

03 USE A PROXY

A proxy service acts as a relay, taking a site you'd like to access and transmitting it back to you through its own IP and web address. Much like a VPN, your ISP can only see you accessing the proxy site, so it defeats DNS



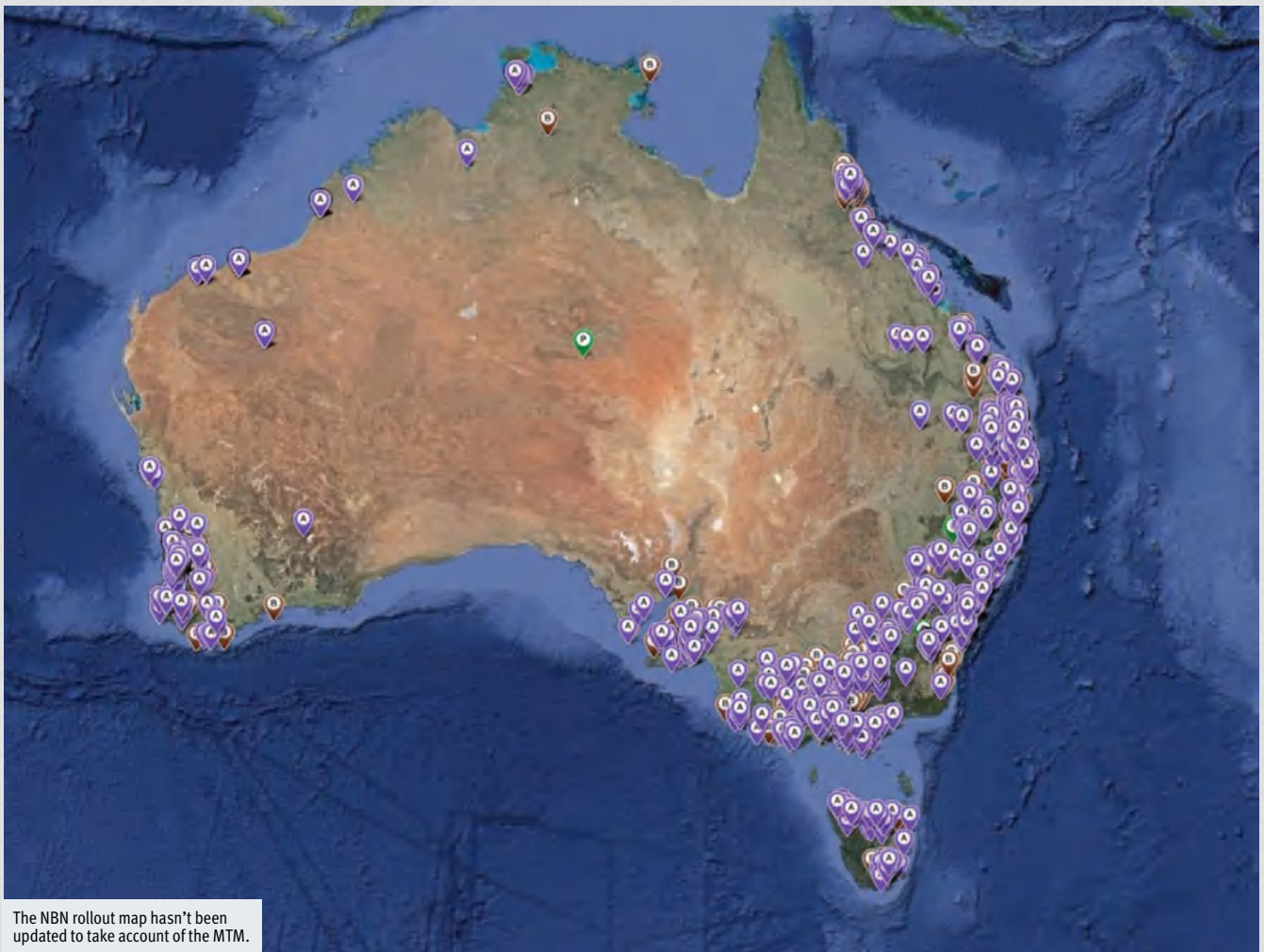
poisoning and IP address blocks. Technically deep packet inspection could work against unencrypted proxies, so you might have to do a bit of trial and error if your ISP uses deep packet inspection.

There are dozens of free proxies around, and a number of paid services as well (although if you're going to pay, you're better off with a VPN). We should note that many free proxy services are not encrypted and thus susceptible to packet inspection, with encryption only available on a paid version. Many are ad-supported too.

We've tried out a bunch of free proxies,

and the two we're most fond of right now and which worked seamlessly on the half dozen popular sites we've tried are HideMyTRAX (hidemytraxproxy.ca) and Proxy Pronto (www.proxypronto.com), which both support encryption.

Using a proxy service is actually very simple. You head to the home page and type or paste the web site address of the site you'd like to access into the field. The page then loads within a frame of the proxy service provider. You'll see that the address bar remains that of the proxy provider. You can then navigate around the site as normal. ■



The NBN rollout map hasn't been updated to take account of the MTM.

[HOME NETWORKING]

Prepping for the NBN

AS THE NBN IS ROLLED OUT TO MORE LOCATIONS, IT'S TIME TO MAKE SURE YOU'RE READY FOR WHEN IT LANDS IN YOUR NEIGHBOURHOOD.

[NATHAN TAYLOR]

ONCE UPON A time, getting your home network ready for the NBN was pretty easy. All you needed was a broadband router with a Gigabit Ethernet WAN port. Many ADSL modem routers actually started coming with such ports built in, so they could be switched over to the NBN when the time came.

But that's no longer the case. The Coalition's new Multi-Technology Mix (MTM) NBN has made it quite a bit harder to prep for. If you were buying a router today, you'd have no real guarantee that it would be useful once the NBN comes to town. Still, we'll try and take a look at the different technologies below and what they'll entail for your home network.

HOW DO I KNOW WHICH I'M GETTING?

At the moment, that's really kind of the million dollar question. NBN doesn't yet break down the rollout by technology type. If you visit www.nbnco.com.au/connect-home-or-business/check-your-address.html, you'll get a view of the current and near future availability of fibre to

the home and wireless plans, but it hadn't (at least at the time of writing) been updated to include plans for the full MTM rollout.

Still, you can make some educated guesses. If you live in a house in an area that already has fibre to the home rolled out (even if it's not connected) or one that has fibre listed as coming, then fibre to the home (FTTH) is likely what you'll get.

If you live in Sydney, Melbourne or Brisbane and can currently get either Telstra or Optus cable internet (check www.telstra.com.au/personal or optus.com.au for availability of cable in your home), you'll almost certainly end up with the hybrid fibre-coax (HFC) version of the NBN. But that's not quite the end of it. Cable passed a lot more homes than it was actually connected to. If you live in the area of the "cable footprint" (so your neighbours might currently get it even if you personally don't), you'll also likely end up on HFC. The NBN has committed to re-expanding and upgrading the HFC so that all users in the footprint can access it —

around 3 million homes in total are expected to be covered.

If you're not in the cable footprint but can currently get ADSL2+ services, you'll likely be moving to fibre-to-the-node (FTTN) in the future. FTTN uses an upgraded version of DSL — VDSL2 — to deliver faster services.

If you live in an apartment block and can't get HFC, you'll likely get fibre-to-the-building (FTTB), which in practice is very similar to FTTN. The NBN runs a fibre cable to the basement of your building, then uses the existing internal building phone wiring to make the last little trip to your unit using VDSL2.

Finally, if you live in a regional area and can't currently get ADSL2+, you're most likely to end on fixed wireless (or satellite, if you're really remote).

AND WHAT WILL I NEED?

The specific network hardware you'll need is dependent on the type of network you'll be getting.



A standard broadband router with a Gigabit Ethernet WAN port is what you need for FTTH.

FTTH

If you can get or will get fibre to the home, you'll need a router with a Gigabit Ethernet WAN port. Most common broadband routers are exactly that, and many newer ADSL2+ routers also have a gigabit WAN port (or a LAN port that can be reassigned as a WAN port) in anticipation of the FTTH upgrade.

With FTTH, the NBN installs a fibre terminator box on the outside of your home and runs a standard Ethernet cable inside to connect to your router. From a user setup perspective, it's very simple.

FTTH currently offers plans up to 100Mbps, with 1,000Mbps to come.

HFC CABLE

At the moment, the rollout roadmap for HFC is a little fuzzy. NBN has officially acquired (with ACCC approval) Telstra's cable network, and has initial technology trials for the service starting late this year, while full integration into the NBN is expected to start next year. When it's rolled out, all ISPs that offer NBN connectivity will be able to offer their services over HFC — unlike the current situation where only Telstra and Optus offer cable internet on their own networks.

HFC will initially offer 100Mbps connections — which it already does if you have Telstra or Optus cable internet. In 2017, NBN says it will start to roll out an upgraded service using Data Over Cable Service Interface Specification (DOCSIS) 3.1, as opposed to the current DOCSIS 3.0. That will allow the shared cable to carry more data, but what that means for actual subscriber service speeds hasn't yet been revealed. Subscriber speeds up to 500Mbps and even 1000Mbps are certainly possible, but we don't yet know if they will be offered.

If you currently have a cable modem, you should be able to continue to use it with the new NBN HFC. If you don't, then you'll need to get a new modem if and when you switch over to HFC. It's not clear yet if the current crop of cable modems are upgradeable to DOCSIS 3.1.

FTTN AND FTTB

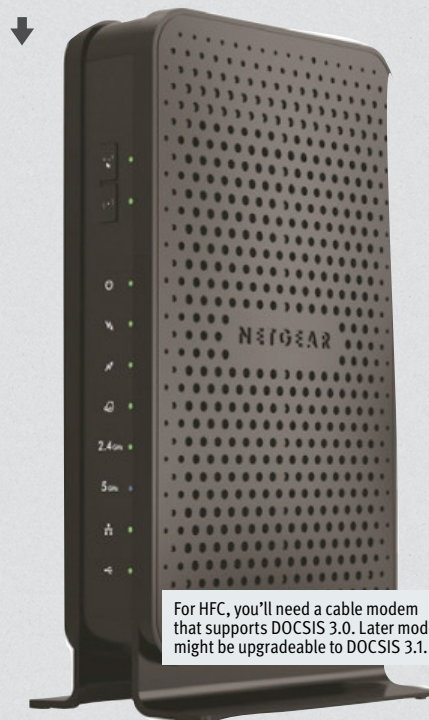
For a big chunk of the telecomms network, FTTN and FTTB will be the NBN solution. Both of these solutions use VDSL2, which is essentially an upgraded version of ADSL. Since DSL services are limited in speed by the line distance between the user and the exchange, the idea is to reduce that distance by installing "mini-exchanges" also known as "nodes" at frequent intervals or in the basements of multi-dwelling units.

VDSL2 speeds, like ADSL, will be somewhat variable, and 100Mbps will not be an option in a lot of cases. According to NBN, for example, in its current FTTB trials, the average user speed was 89Mbps down and 36Mbps up. It may be that FTTN/FTTB services are sold as "50Mbit" services.

You'll need a VDSL2 modem router to access the FTTN/FTTB network. The good news, if you're currently looking for an ADSL modem router, is that some new models are appearing that support both ADSL and VDSL out of a single port. The AVM FRITZ!Box Fon WLAN 7360, Netgear D7000 Nighthawk, ASUS DSL-AC68U, NetComm Wireless NF8AC and DrayTek Vigor 130 are just some models that have VDSL support.

FIXED WIRELESS

Fixed wireless is currently available in speeds up to 25Mbps up/5Mbps down and it involves having a directional antenna mounted on your



For HFC, you'll need a cable modem that supports DOCSIS 3.0. Later models might be upgradeable to DOCSIS 3.1.

LAN SETUP

We've talked a lot about the WAN setup, but if you're anticipating the NBN, you should also be looking at your LAN. For a 100Mbps internet connection, neither Fast (100Mbps) Ethernet or 802.11n (150/300/450Mbps) wireless is going to cut it. It sounds like they should, but neither is 100% efficient meaning that a lot of the internet bandwidth will be lost.

You should start to think about ensuring that all your wired LAN ports are of the gigabit (1,000Mbps) flavour, while 802.11ac wireless is very useful for the NBN. Thankfully the new routers that support VDSL typically also support gigabit wired and 802.11ac — though many older cable and broadband routers don't.

roof. A cable runs from the antenna to an NBN connection box in the home. In turn, a standard broadband router (with an Ethernet WAN port) connects to the connection box. You don't need anything special for fixed wireless — you can even persist with last generation LAN speeds because it doesn't need anything faster. ■



The DrayTek Vigor 130 is one of a new range of routers that support both ADSL and VDSL.

Control of depth of field means a sharp subject stands out against a blurred background



[PHOTOGRAPHY MASTERCLASS]

Core photography skills: depth of field

LEARN HOW TO CONTROL HOW MUCH OF YOUR PICTURE IS IN FOCUS. HERE'S THE KNOWLEDGE YOU NEED...

[MARCUS HAWKINS]

WHAT EXACTLY IS DEPTH OF FIELD?

The lens on your camera can only be focused at one distance at a time. But there's an area that extends outwards from the point of focus, both towards the background and towards the camera, in which objects still look relatively sharp. This is referred to as the depth of field.

HOW BIG IS IT?

Depth of field is a movable feast. Sometimes it's

shallow, with a wafer-thin section of the scene appearing to be focused; at other times it can be much larger. There's no abrupt end to the depth of field, rather a gradual transition from sharpness to blur.

You can manipulate the depth of field for a creative effect. For instance, you can't focus on both a flower close to the camera and a mountain on the horizon — only one or the other. However, you can get both to appear

sharp by increasing the depth of field. The opposite is preferable in a portrait, where a shallow depth of field helps to separate the subject from the background.

HOW DO I CHANGE THE DEPTH OF FIELD?

There are several factors that affect the depth of field. The size of the sensor in the camera plays a part: larger sensors make it easier to achieve shallow depth-of-field effects, while smaller

WHAT AFFECTS DEPTH OF FIELD?

Discover how aperture, sensor size and focal length affect what will appear sharp.

APERTURE

Use smaller apertures to increase the amount of a scene that appears sharp and larger apertures to decrease it.

SENSOR SIZE

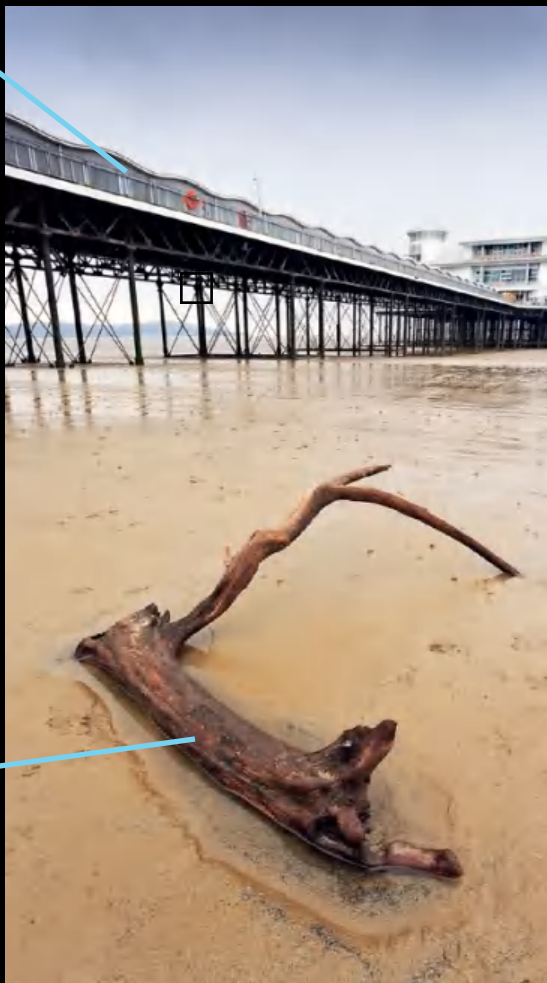
It's considerably easier to achieve a shallow depth of field with a full-frame SLR than an APS-C one, as you have to be closer to the subject to achieve the same image size.

FOCAL LENGTH

The longer the lens, the more exaggerated the effect of a shallow depth of field at wider apertures. The reverse is true with wide-angle lenses.

FOCUSING

The closer you are to the subject you're focusing on, the shallower the depth of field becomes.



sensors make it easier to make more of a scene appear sharp.

However, most of us don't have the luxury of swapping camera bodies to exploit the different benefits each offers for depth of field. But you can directly affect the depth of field by your choice of aperture and the distance at which you focus.

HOW DOES THE APERTURE CHANGE THE DEPTH OF FIELD?

Larger apertures, represented on the camera by low f-stops like f/1.4 and f/2.8, let in more light, while smaller apertures like f/16 and f/22 let in less light. The choice of aperture has much more impact on the look and feel of an image than brightness alone.

Although small apertures let in less light, they offer a wider depth of field. Landscape and macro photographers routinely use small apertures to get more of the picture to appear as sharp. Large apertures produce a narrower depth of field, letting you sandwich a sharp subject between a blurred foreground and background. The closer you are to the

foreground, and the more distance there is between the subject and the background, the more pronounced the effect.

HOW DOES THE FOCUS DISTANCE AFFECT THE DEPTH OF FIELD?

The closer you are to a subject and the closer you focus, the shallower the depth of field becomes. The effect is particularly obvious when you use a macro lens. Focus on a flower just in front of the camera, and the depth of field will be very narrow, even with a small aperture of f/16 selected. Move away from the flower and focus on it again, and the depth of field will be noticeably more extensive.

DOESN'T A WIDE-ANGLE LENS GIVE A GREATER DEPTH OF FIELD THAN A TELEPHOTO ONE TOO?

Internet forum debates about depth of field quickly descend into arguments about the effect of focal length. On the surface, it does seem that you can get more of a scene to appear sharp with a wide-angle lens. However, as long as the subject remains the same size in the frame, the

EXPLAINED: CAMERA SETTINGS

How to check for sharpness.



ENTER LIVE VIEW

Although it's easy enough to check the depth of field when you're looking through the viewfinder, the image magnification feature of Live View makes it much easier to see which areas of the picture will be sharp and which will be blurred.



MAGNIFY THE IMAGE

The image is displayed at the lens's largest aperture, even if you've dialled in a smaller aperture on the camera. Here, we've set an aperture of f/16, but the depth of field being shown is that of the lens's brightest f/2.8 aperture.

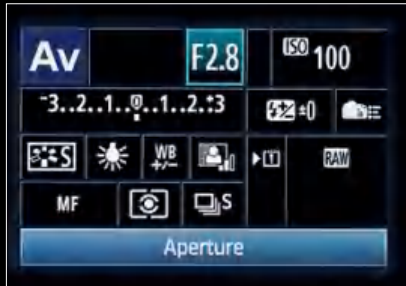


USE DEPTH OF FIELD PREVIEW

By activating the depth of field preview, the aperture will be 'stopped down' to the aperture set on the camera. By holding the button down and rotating the command dial, you can see the effect that a different aperture has on the image.

HOW APERTURE AFFECTS SHARPNESS

By changing the size of the opening in the lens, you can increase or decrease the degree of sharpness in your pictures.



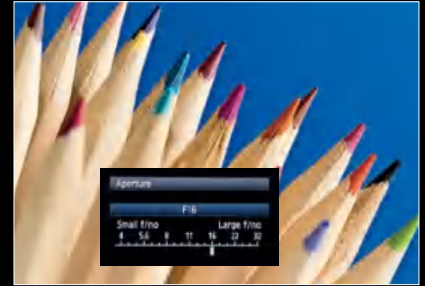
APERTURE PRIORITY

Aperture Priority and Manual modes enable you to set the size of the aperture according to the effect you want to achieve. If you're new to photography, stick with Aperture Priority, as the camera will automatically set a shutter speed to match the aperture in order to produce a balanced exposure.



LARGE APERTURE

To reduce the depth of field, go for a larger aperture by dialling in a low f-stop on the camera body. You can't select an aperture larger than the maximum f-stop offered by the lens. For instance, a 300mm f/4 lens's maximum aperture is f/4, and you won't be able to set apertures of f/2.8 or f/1.4.



SMALL APERTURE

To increase the depth of field, use smaller apertures, as signified by high f-stop numbers such as f/16 and f/22. Avoid using the smallest aperture available on the lens — despite this offering the greatest amount of depth of field, it actually leads to softer pictures due to an effect known as diffraction.

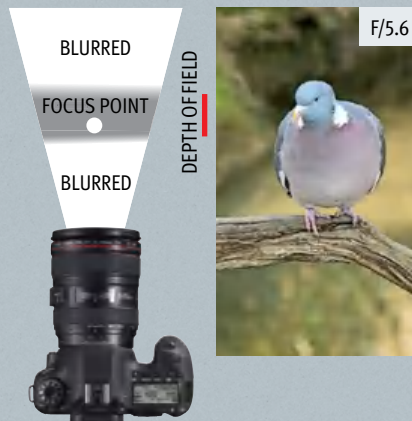
SHOOTING ADVICE DEPTH-OF-FIELD DECISIONS

Take charge over depth of field. Here are four familiar examples...



LANDSCAPES

If you need extensive depth of field, choose a small aperture and manually focus at hyperfocal distance.



PORTRAITS

Select a wide aperture to create a shallow zone of sharpness and a nicely diffused backdrop.



CLOSE-UPS

Press the depth of field button, manually focus past the point you want sharp, then pull the focus back.



LOW LIGHT

When light levels drop, you may have to use larger apertures to let as much light in as possible.

depth of field will be essentially the same for a given aperture, whether you're shooting with wide 14mm lens or a long 400mm one.

The reason that depth of field is perceived as being shallower with a telephoto lens is down to the angle of view. Longer lenses compress a scene and show substantially less of the background, so any blurred features will appear larger in the picture.

To maximise the effect, get close to the subject, ensure the background is a good distance away and choose a large aperture. With a shallow depth of field, you'll need to be bang-on with the focusing, so select an AF point in the viewfinder that lines up with the focal point of the picture — such as the eyes in a portrait.

AND HOW DO I MAXIMISE THE DEPTH OF FIELD INSTEAD?

To get as much of a scene as you can to appear sharp, use small apertures and wide lenses, and focus on subjects that aren't close to the lens. Landscape photographers often use hyperfocal focusing to increase the depth of field. This involves manually focusing at a distance approximately one third of the way into the scene, making nearly everything look sharp.

Because the hyperfocal distance changes according to the camera, lens and aperture you're using, you'll get the best results by using a depth-of-field calculator to give you the precise distance at which to focus. There are many free ones available both online and as smartphone apps. ■

WHAT WOULD STEVE DO?

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[AV MASTERCLASS]

HDMI 2.0a, 1.4, 4K, and beyond

A PRIMER ON HDMI VERSIONS AND CABLES.

[SIMON CHESTER]

IN APRIL OF this year, the HDMI Forum — that is, the not-for-profit body responsible for creating and maintaining the HDMI specification — announced its latest update to the now ubiquitous spec: HDMI v2.0a.

The update brings only a minor — if important — change: support for HDR video (see *Techlife* June 2015, page 98). Despite this only being a small change (thus the ‘a’ suffix, rather than even a minor version bump), it also appears to have brought with it a host of consumer confusion: should a would-be TV or video source purchaser be demanding v2.0a compliance in their prospective product? Do you now need to upgrade your cables? How does it differ from HDMI v2.0? v1.4? Are my 1.4x devices now thoroughly outdated?

Given the confusion, I thought it pertinent to visit just what the different versions of the HDMI specification mean, and how they relate to devices and cables.

HDMI 2.0A VS. 2.0

So, the first thing to cover is how HDMI v2.0a compares to v2.0. As mentioned earlier, HDMI v2.0a adds support for HDR video. HDR video,

as I have previously discussed, is a method to enhance the brightest and darkest parts of a video image. Previously, it’s been very difficult to simultaneously display very bright and very dark shades on-screen — such as car headlights in a night shot. The extended attributes of HDR video contain extra information that an HDR-compatible TV (such as high-end models from Samsung, Panasonic, Sony et al.) can understand and display — bringing incredible clarity and depth to images that previously ended up looking a little washed out. Even in scenes where the contrast isn’t as pronounced, HDR video will bring deeper colours, producing better image quality across the

“GIVEN THE CONFUSION, I THOUGHT IT PERTINENT TO VISIT JUST WHAT THE DIFFERENT VERSIONS OF THE HDMI SPECIFICATION MEAN, AND HOW THEY RELATE TO DEVICES AND CABLES.”

When you purchase a premium HDMI cable, all you’re paying for is aesthetics — the image and sound quality are identical.



board. The new HDMI spec isn’t the only part in this process, however — new Blu-Ray discs, codecs, and display panel technologies are all required for this to work.

Now, while I always like to future-proof my purchases, given that the only benefit to HDMI v2.0a over HDMI v2.0 is the addition of HDR, and that you need both a compatible TV and Blu-Ray player or other video source, then it’s not really something that you need to worry about right now. In other words, if you’re looking to buy a Blu-Ray player now, it’s not worth paying extra for or holding off on, as you’ll need a new TV and new copies of your favourite movies for it to make any difference. The golden rule when buying devices is to look at the features that interest you (such as 4K 3D etc.), not the HDMI spec version behind them.

... VS. 1.4

As is expected in the version numbering, the upgrade from HDMI v1.4 to v2.0 brought with it some much more significant changes — but not so significant that you should be tempted to upgrade your video sources, or even your TV.

While it may not look like much, it’s as effective as its expensive brethren.



There are a host of other non-standard cables out there, such as this 90 degree connector, that may have different price points, but should still stay below ‘premium’ price levels.



For runs longer than 30m, you'll need an HDMI extender, as well as thicker cables.



The biggest change from v1.4x (encompassing 1.4, 1.4a, and 1.4b) to v2.0 was an increase in available bandwidth between HDMI devices (up from 10 gigabits per second to 18), which means that 4K content can now stream at 60 frames per second (fps), and HDMI can carry up to 32 audio channels. Now, it's worth pointing out here that v1.4 already supports 4K, but 'only' at 24 fps.

Why the scare quotes around 'only'? Because most 4K content will remain at 24fps, anyway, as gaming — the biggest driver for high fps content — won't hit 4K for many years, and — with the exception of perhaps some concert videos and reality TV shows — pretty much all video content is, and will remain, shot at 24fps anyway, as that's what people like to see.

The extra bandwidth of HDMI 2.0 also allows 4K 3D content — which may appeal to those die-hard *Avatar* fans, but otherwise holds rather niche appeal — as well as high framerates (60+) for lower resolutions, including 1080p, which is great for PC-based applications, including home videos and gaming (not consoles just yet: they are only v1.4a — although HDMI v2.0a versions are impending). Also of note is the addition of support for a 21:9 aspect ratio, which is closer to the true cinema aspect ratio, but of no real practical benefit outside of native 21:9 projectors or TVs.

Perhaps more interestingly, HDMI v2.0 also allows the streaming of two HD streams

simultaneously, which, with some in-TV voodoo (and the use of 3D glasses), can allow two people to watch two different sources on the same screen.

WHAT DOES IT ALL MEAN?

So, what does all this mean for consumers? Not much, actually, it's all rather behind-the-scenes, and implemented early so as to cause minimal problems — HDMI 2.0 was introduced about two years ago, and is backwards compatible with older v1.4 equipment anyway (that is, any HDMI v2.0 equipment you own will have no trouble working with older v1.4 equipment).

Which brings me to the second half of this article: HDMI cables, and the suspicious claims made by manufacturers.

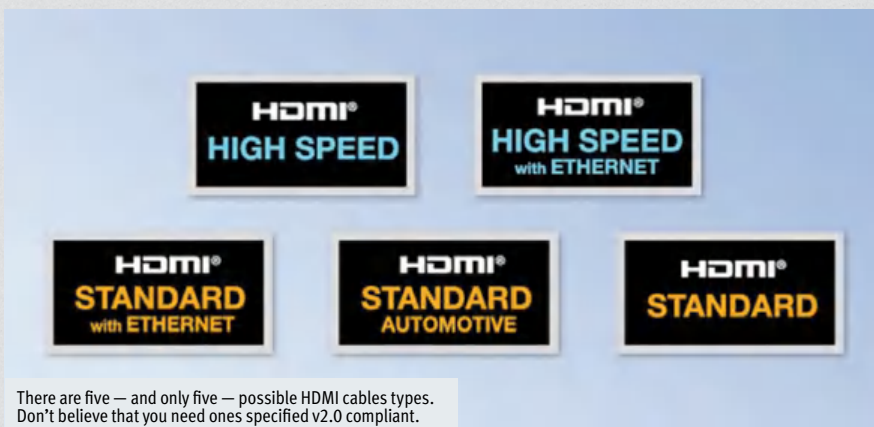
CABLES — STILL THE SAME

What I really need to drive home with all these new specs is that none of them affect the cables joining the devices. The HDMI 'high speed' cable spec is still above the bandwidth requirements of HDMI v2.0a, and each new addition to the spec has been designed to work with existing cables.

In fact, even among all these spec changes,

HDMI BY THE BIG GUYS

Looking to find out more about HDMI cables from a trusted source? Here's the breakdown of the types from the HDMI Forum themselves: www.hdmi.org/consumer/finding_right_cable.aspx. Indeed, they've also published this handy HDMI buying guide, which covers devices and cables alike: www.hdmi.org/consumer/buying_guide.aspx.



There are five — and only five — possible HDMI cables types. Don't believe that you need ones specified v2.0 compliant.

there are still only 5 types of HDMI cables available on the market: 1 for automotive applications, and 4 for home use. The ones for home use can be broken down as such: standard speed without Ethernet, standard speed with Ethernet, high speed without Ethernet, and high speed with Ethernet.

Standard speed cables are hard to come by these days, as they were the first version of HDMI, and only had enough bandwidth to support 720p or 1080i video. The price difference between a 'standard' speed and a 'high' speed is now so negligible that they have all but faded from the market.

The 'high' speed cables are tested to perform well above current HDMI specs, and thus support 1080p, 4K, 3D, high framerate, deep colour, HDR and every other part of the HDMI spec to date.

The other differentiator of the cables — Ethernet — defines if you want the cable to be able to carry a networking (likely internet) signal, which, with compatible equipment, allows you to share a single Ethernet/internet connection between devices. Practically, this means that you can connect your TV to your home network, and every Ethernet compatible device connected to the TV will then be able to access the internet, without taking up an Ethernet port of its own.

What this means is that, if you purchase a \$3 'high' speed 'HDMI v1.4' cable, it will work exactly the same as a \$100 'high' speed 'HDMI v2.0' cable. If it's designated 'high' speed, then it's effectively the same no matter what material it's made from, what thickness the wires are (with one exception — long cable runs — see right), what jacket it's wearing, or — critically — what version of HDMI the packet says it's designed for. Indeed, it's these superficial differences that you're paying for: not actually a cable that will deliver a better signal, just a cable that's built differently.



On rare occasions, a defective HDMI cable will produce static over the image. Most of the time however, it will just result in a 'no signal' error.

AN EXCEPTION TO THE RULE... LONG CABLE RUNS

Now, there is one exception to this 'cheapest you can find' rule, namely: long (greater than 10 metre) cable runs. With runs this long, it's more difficult to send a signal, so any faults or bad designs in the cheaper cables that didn't cause any problems on the shorter runs may come to the fore. Just like with speaker cable, long runs require thicker cables, and they end up charging accordingly. Still, you can get away with paying around \$50-\$60 for a 20m cable.

Sadly for the frugal, tests have shown that cheaper cables are more likely to fail on these longer runs than expensive ones. However, this isn't an argument to buy more expensive cables every time, or even for longer runs: many cheap cables still work fine for longer runs, and as you could buy a handful of cheap cables for the price of a single long premium one, you're still better off gambling with a few cheap cables, anyway.

If you're looking to go for a very long run, 30 metres or more, the HDMI spec says that you really need to buy an HDMI signal booster. However, there are now cables on the market that contain little passively powered chips (such as the chips made by RedMere) in them that can help you reach longer distances than otherwise possible, or — on the flipside — reduce the required thickness of a cable for a given length, which can be a blessing when you're having to route a long cable through a wall or around door jams and skirting boards. However, buying any of these cables from a retail outlet in Australia will sting you in the hundreds of dollars, but I did find one 30m RedMere cable on eBay for just over \$100 including shipping. If only Monoprice delivered to Australia.



Both the PS4 and the Xbox One are 'only' HDMI v1.4, but there are rumours of v2.0a models coming soon.

+

"I'LL SAY IT ONE MORE TIME TO BE SURE: THE UPSHOT OF ALL OF THIS IS, WHEN BUYING HDMI CABLES, BUY THE CHEAPEST VERSION OF THE RIGHT LENGTH THAT YOU NEED."



Both the PS4 and the Xbox One are 'only' HDMI v1.4, but there are rumours of v2.0a models coming soon.

HELP STATION
HDMI 2.0A, 1.4, 4K, AND BEYOND

WORKING IS WORKING — NO NEED FOR EXPENSIVE CABLES

Now, what's interesting about HDMI cables — and counter-intuitive when compared to older analogue cables — is that picture quality doesn't actually deteriorate with signal quality. That is, if you have a poor signal, the image will work despite it, or it will just drop out completely. If you have a picture coming through on your TV, it is a 100% accurate representation of the video signal sent to it — the cable can't introduce fuzziness, poor colour, or any of the image problems that some expensive cable manufacturers claim to fix. To put it simply: if you're getting an image on your screen with your \$3 cable, then it is exactly

the same image that you would get had you bought a \$150 cable. Exactly. The. Same. And that goes for audio over HDMI, too.

This is because the HDMI spec contains error correction that leaves no room for approximation — either the correct data comes through, or it is dropped completely. If it's dropped completely, you'll see it, either manifesting as missing pixels on-screen that look like snow (a rare occurrence), or in a 'no signal' error or blank screen (much more likely). Likewise, with audio: you won't get less fidelity if the cable isn't working correctly, you'll get silence.

Thus, you never have to worry that the image you have on-screen may be improved by a cable

upgrade — if it works, it's the best it'll ever be. If you're unhappy with the picture quality, try calibrating your TV or fiddling with the settings (See Techlife 29, page 98, October 2014 for tips on that front).

I'll say it one more time to be sure: the upshot of all of this is, when buying HDMI cables, buy the cheapest version of the right length that you need. There is no practical difference between a \$3 high-speed cable purchased from eBay and a \$150 premium high-speed cable purchased from a retailer. Even if your el-cheapo cable fails or doesn't work out of the box, it's still going to be cheaper to buy a replacement cheap one from a different seller than it is to buy a premium one the first time. ■



For longer runs of 10m or more, you're best off with thicker cables.

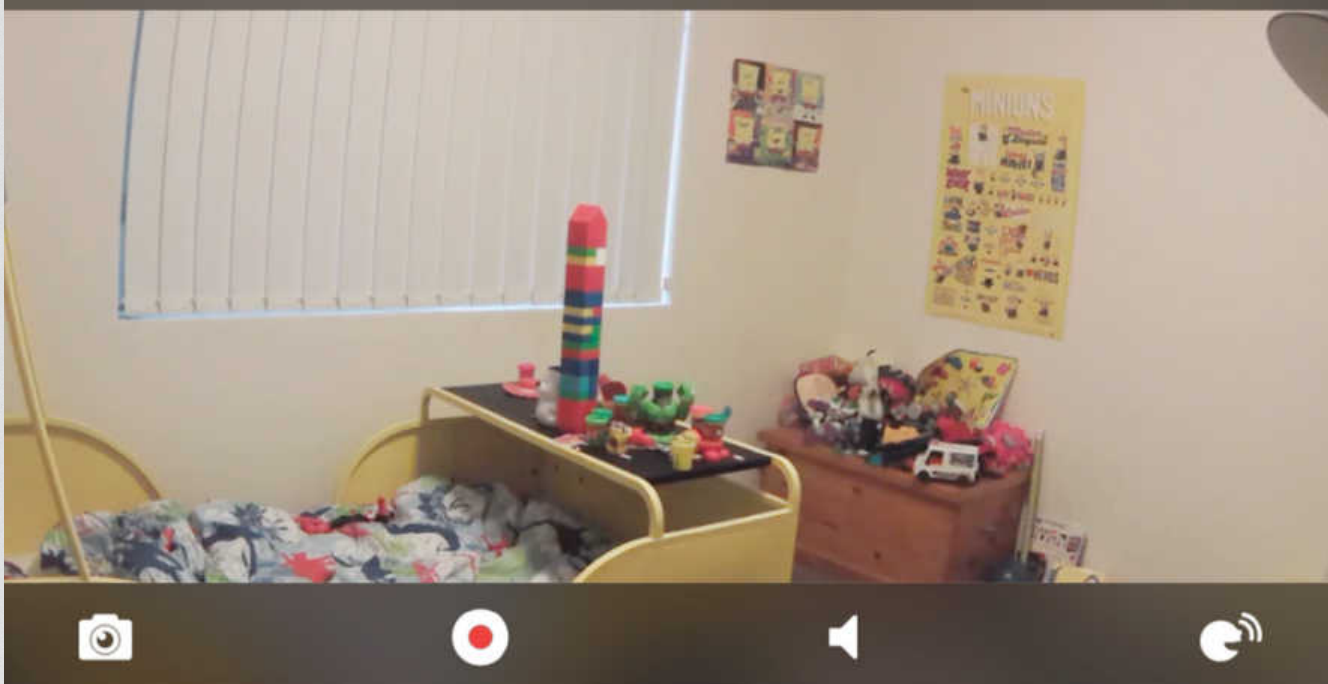


You can get away with using thin or low-quality cables over short distances.

Done

Jacob room

The Belkin NetCam HD+ gives you a live view of any room in the house from your smartphone or tablet.



[SMARTHOME MASTERCLASS]

Smarten up the kid's room

KEEP THE YOUNGER ONES SAFE AND HELP THE OLDER ONES WITH THEIR HOMEWORK.

[JENNETH ORANTIA]

SMART HOME GADGETS aren't just for the grown-ups. You can use these devices to benefit the kids as well, whether it's keeping tabs on them while they're in or out of the house or helping them with their homework.

SMART SAFETY AT HOME

For kids that are too young to need their own privacy, installing a smart security camera like the Belkin NetCam HD+ offers multiple benefits. Once it's in place, you can quickly check what the kids are up to from another part of the house by opening the NetCam app on your smartphone or tablet and checking out the live video feed. The night vision mode also works a treat for checking up on sleeping babies and toddlers, switching to a high-visibility monochrome view courtesy of the 12 infrared LEDs that circle the camera lens.

The Belkin NetCam HD+ can perform a few other tricks, too. Using the built-in two-way intercom, you can tell your kids to come down for dinner or stop fighting with their siblings without having to yell up the stairs like a crazy person. If you catch your kids doing something particularly adorable (or naughty), you can snap photos or videos from the NetCam app, which are saved to your mobile device. Since it works over both a Wi-Fi and 3G/4G data connection, you can also set it up as a 'nanny cam' when

you've got a babysitter over to check that the kids have gone to bed on time.

LOCATION, LOCATION, LOCATION

But what if your kids are too old to have a video camera playing big brother in their bedroom? You can still keep tabs on them without stepping over the line using a smartphone solution, and since this works both in and out of the house, it's actually a more complete solution than the stay-at-home IP camera.

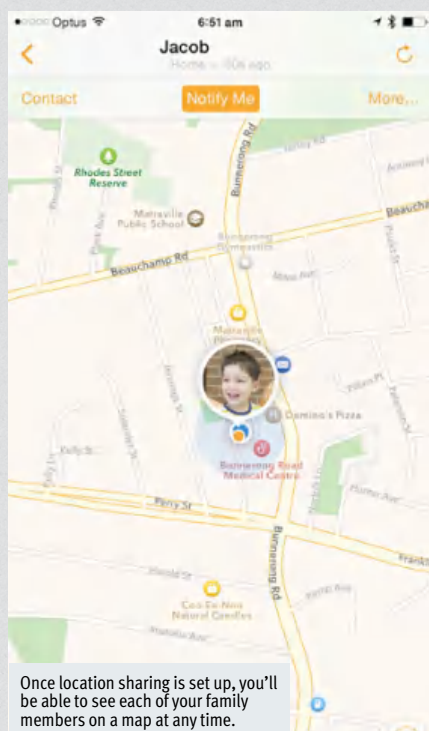
For Apple-only households, the new location-sharing feature in iOS 8 will keep track of where your kids are at any time. To set up family sharing, go to 'Settings > iCloud' and tap 'Set Up Family Sharing'. You'll need to confirm that you're the family 'organiser' — which essentially means that everyone that you sign in as part of the family will be able to use your credit card to make iTunes and App Store purchases.

Once you're set up as the organiser, you'll need to invite other family members to join the group. This is done by going to 'Settings > iCloud > Add Family Member', however this step assumes the person already has an Apple ID. For kids that are too young to create one, you can set one up on their behalf by going to 'Settings > iCloud > Family', tapping the small "Create an Apple ID for a child" at the bottom



Each person that you add to the family will need to accept the invitation before you can see their location.

"BUT WHAT IF YOUR KIDS ARE TOO OLD TO HAVE A VIDEO CAMERA PLAYING BIG BROTHER IN THEIR BEDROOM?"



of the screen, and going through the rest of the prompts.

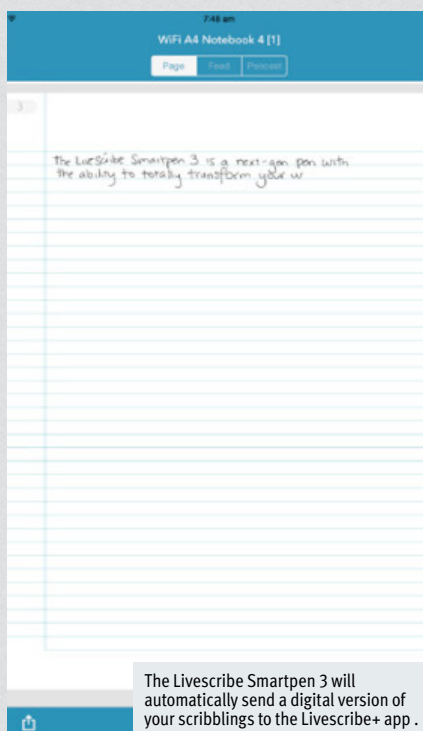
After your kids have accepted the Family Sharing Invitation and opted to share their location, you'll be able to see their location at any time by downloading the Find My Friends app. From here, you can also set up notifications so that you get an alert whenever that family member arrives or leaves a particular location. If you wanted to set this up for his school, for instance, tap on 'Notify me', tap 'Leaves' and tap the 'Change location' link to change the location to their school.

Google doesn't have an equivalent feature in Android, but for non-Apple households, Life360 is a decent third party alternative that works across iOS, Android and Windows Phone.

NEW AGE NOTE TAKING

Modern kids may be used to lugging laptops and tablets around, but as convenient as these devices are, they may not be the best tools for helping with their schoolwork. Numerous studies have found that handwriting, as slow as it is compared to typing on a keyboard, is better suited for learning, as the effort of having to summarise what the teacher is saying into written form (as opposed to speedily typing everything out) helps cement that material in their memory. Essentially, noting things down by hand engages the part of the brain that is associated with memory formation more so than typing it out on a keyboard.

Up till now, tablet manufacturers like



Microsoft and Samsung have tried to recreate the handwriting experience on a touchscreen, but these still lag significantly behind the manual process. The same can be said for Bluetooth styluses that are designed to work with iPads. This is where a device like the Livescribe Smartpen 3 comes in handy. It works much like a regular pen, in that you write things down on paper (albeit specially printed Livescribe dot paper), but everything is then wirelessly transmitted to an iOS or Android device over Bluetooth, and from there, you can convert your handwriting to text (provided your

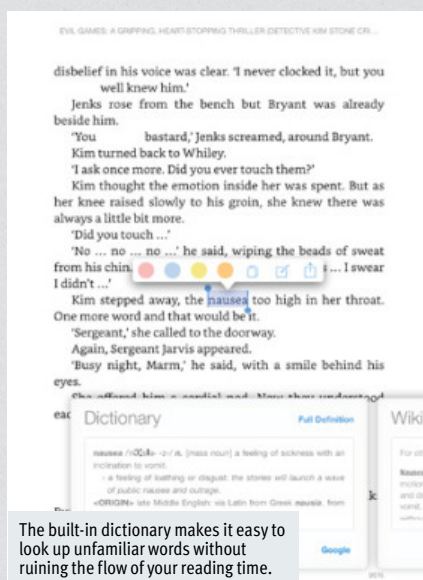
scribbles are neat enough), send it on to schoolmates as a PDF, or share it with popular note-taking platforms OneNote or Evernote.

The steep up-front price of the pen (\$200) isn't the only thing you'll need to factor in, though. You'll also need to buy special Livescribe notepads, as the digital recognition doesn't work when you write on regular paper. The good news is that the notepads aren't too expensive (you can get a four-pack of notepads for \$29.84), and if you're really skint, you can print Livescribe dot paper for free using a laser printer: www.livescribe.com/au/support/wifi-smartpen/howto/print_dot_paper.html.

UPGRADE YOUR PAPERBACKS

Reading books on paper is for amateurs. Switching to a digital solution will not only save money (popular classics that are out of copyright can be downloaded for free on most e-reader platforms, such as *A Tale of Two Cities* by Charles Dickens, *Othello* by William Shakespeare, and *The Picture of Dorian Gray* by Oscar Wilde), but you can do more with the text while you're reading it.

Using the Kindle app (available on iOS, Android, Windows Phone, Windows 10 and Mac), you can tap and hold on any word to see its definition in a dictionary or Wikipedia, and even translate the word to a different language. You'll never lose your page in a book again, as it automatically opens to the last page you were reading, and you can also search for specific terms in the book, which is handy if you're studying a text and need to find a quote or theme. Another nifty feature for studying books is X-Ray, which shows you where key people, places and terms appear throughout the book. ■





















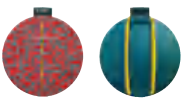




















BUYER'S GUIDE

YOUR READY RECKONER TO THE BEST TECHNOLOGY PRODUCTS

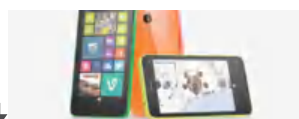


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NETWORKING EQUIPMENT	ADSL ROUTERS (WITH MODEM)	 [BEST BUDGET] Netgear DGN2200 \$99 www.netgear.com.au It's only 802.11n, but it has the basics you need plus an excellent, easy-to-use interface.	 [BEST VALUE] TP-Link Archer D7 \$170 www.tp-link.com.au The UI is a little no-frills, but once set up this is a very solid AC1900 router for a price well below the average.	 [BEST PERFORMANCE] ASUS DSL-AC68U \$300 www.asus.com/au It ain't cheap, but if you want it all, this 802.11ac unit is fast and packed with handy enthusiast features.	 [NEW ON SHELF] Netgear Nighthawk D7000 \$350 www.netgear.com.au This new release from Netgear includes all the Nighthawk R7000's great features and adds an ADSL modem as well.
		 [BEST BUDGET] Netgear WNR2000 \$70 www.netgear.com.au It's only 802.11n, but for around \$70 this four-port router will cover the basics.	 [BEST VALUE] TP-Link Archer C7 \$150 www.tp-link.com.au This modemless version of the D7 (above) has all the basics you'll need to set up a 1,300Mbps AC network.	 [BEST PERFORMANCE] Netgear Nighthawk R7000 \$210 www.netgear.com.au If you want top speeds and premium features including great Wi-Fi range, then this is our recommendation.	 [NEW ON SHELF] Linksys EA8500 \$429 www.linksys.com/au The latest 802.11ac router from Linksys adds MU-MIMO to the mix, which should mean faster speeds for all your devices.
		 [BEST WIRELESS EXTENDER] Netgear EX6200 WiFi Range Extender \$129 www.netgear.com.au This AC extender is capable of speeds up to 867Mbps, has great range and can host storage via its USB 3.0 port.	 [BEST WIRELESS BRIDGE] Linksys WUMC710 \$140 au.linksys.com This 802.11ac bridge is a great way of linking a up to four wired network devices to a 1,300Mbps AC network.	 [BEST POWERLINE ADAPTER (BUDGET)] Netcomm NP507 \$140 www.netcomm.com.au These powerline plug adapters are a little big, but include socket passthrough and fantastic speeds.	 [BEST POWERLINE ADAPTER WITH WI-FI EXTENSION] Netcomm NP508 \$145 www.netcomm.com.au If you want to add wireless extension onto powerline capabilities, this topped our 2.4GHz Wi-Fi speed tests.
		 [BEST BUDGET] Lenovo Iomega IX2 \$125 (DISKLESS) www.lenovo.com You'll need to BYO drives, but this very affordable two-bay NAS offers impressive features for the price.	 [BEST VALUE] ASUSTOR AS-202TE \$295 (DISKLESS) www.asustor.com This two-bay NAS offers excellent features and can double as a media player, via XBMC and HDMI-output.	 [BEST PREMIUM] Synology DS414j \$470 (DISKLESS) www.synology.com If you need more space, this four-bay unit runs Synology's excellent NAS OS, which lets you add features via apps.	 [NEW ON SHELF] Thecus N5810PRO \$1,100 www.thecus.com This high-end 5-bay NAS is for users who need top speeds and, with a Celeron CPU, plenty of horsepower.

 <p>[BEST BUDGET] Jabra Solemate Mini</p>	<p>NEW ENTRY</p>  <p>[BEST VALUE] Klipsch GiG</p>	 <p>[BEST PERFORMANCE] Lenco PlayLink 4</p>	 <p>[NEW ON SHELF] UE Roll</p>	<p>BLUETOOTH SPEAKERS BUYER'S GUIDE READY RECKONER</p>
<p>\$69 www.jabra.com Squeezes Jabra's excellent Bluetooth speaker into a more portable package.</p>	<p>\$200 www.klipsch.com.au This portable speaker punches well above its weight in terms of sound quality and isn't overly costly.</p>	<p>\$399 www.amberonline.com.au With an optional battery for portable play, this Bluetooth and Wi-Fi speaker is highly versatile and sounds fantastic.</p>	<p>\$150 www.ultimateears.com This disc-shaped speaker's very portable and waterproof to boot. It doesn't sound half-bad either.</p>	
 <p>[BEST BUDGET] Shure SRH440</p>	 <p>[BEST VALUE] Audio-Technica ATH-M50X</p>	 <p>[BEST PREMIUM] V-Moda Crossfade M-100</p>	 <p>[BEST WIRELESS] Plantronics BackBeat Pro</p>	
<p>\$130 www.jands.com.au Bright, clear sound and great bang for buck.</p>	<p>\$199 www.audio-technica.com.au A well-priced set of over-ear headphones with fantastic audio and detachable cables.</p>	<p>\$270 www.vmoda.com Warm and rich sounding cans with great clarity — these cans handle anything you throw at them.</p>	<p>\$300 www.plantronics.com/au This Bluetooth set of cans blew us away with their great acoustics and noise-cancelling capabilities.</p>	
 <p>[BEST BUDGET] Google Chromecast</p>	 <p>[BEST VALUE] Western Digital WD TV Live</p>	 <p>[BEST PERFORMANCE] Western Digital WD TV Live Hub 1TB</p>	 <p>[NEW ON SHELF] Google Nexus Player</p>	<p>MUSIC HEADPHONES</p>
<p>\$50 play.google.com Google's wireless HDMI dongle streams content to your TV via the Play Store and a variety of third-party apps.</p>	<p>\$120 www.wdc.com It beats many TVs for video format support and its fast processor supports 1080p network streaming.</p>	<p>\$230 www.wd.com A media player done right, this unit can play and serve video to other devices. Easy to use and well-featured.</p>	<p>\$130 play.google.com This official Android-powered media player also includes access to apps and games.</p>	
 <p>[BEST VALUE] Epson EB-W120</p>	<p>NEW ENTRY</p>  <p>[BEST PORTABLE] Optoma ML550</p>	 <p>[BEST HOME THEATRE] BenQ W1070</p>	 <p>[NEW ON SHELF] LG MiniBeam PG60</p>	
<p>\$580 www.epson.com.au This compact 3LCD, WXGA unit has good features and image quality and decently priced lamps.</p>	<p>\$1,200 www.amberonline.com.au This pico projector fits in the palm of your hand and delivers a respectable 500 ANSI lumens brightness.</p>	<p>\$999 www.benq.com.au BenQ's latest 1080p home theatre unit boasts a lower price and longer lamp life than the W1100.</p>	<p>\$999 www.lg.com/au This compact and portable home-theatre projector will go anywhere, though its not high specced.</p>	
<p>NEW ENTRY</p>  <p>[BEST BUDGET] Samsung UA40J6200</p>	<p>NEW ENTRY</p>  <p>[BEST VALUE] Samsung UA55J6200</p>	<p>NEW ENTRY</p>  <p>[BEST PREMIUM] Samsung UA60JU6400</p>	 <p>[NEW ON SHELF] LG 55EC930T</p>	<p>DATA PROJECTORS</p>
<p>\$1,100 www.samsung.com/au A smaller, cheaper option, this 40-inch 1080p LED set offers very good picture quality and smart TV features.</p>	<p>\$1,700 www.samsung.com/au Samsung's new 2015-model 55-inch 1080p LED TV still delivers great image quality at a fair price.</p>	<p>\$2,700 www.samsung.com/au This 60-inch telly is our pick if you want to jump into 4K/UHD, balancing a good price with excellent image quality.</p>	<p>\$3,999 www.lg.com/au This comparatively-affordable 55-inch, 1080p OLED set promises dazzling colours and amazing contrast.</p>	
 <p>[BEST BUDGET] Kogan Atlas X1510</p>	 <p>[BEST ULTRABOOK] Apple MacBook Air 13-inch</p>	 <p>[BEST PERFORMANCE] ASUS G751JT</p>	 <p>[NEW ON SHELF] Venom BlackBook 15 (2014)</p>	<p>TVS</p>
<p>\$329 www.kogan.com.au Packs Windows 8.1, Pentium CPU, 15.6-inch screen and a 500GB hard drive for a keen price.</p>	<p>FROM \$1,399 www.apple.com/au This thin, lightweight unit has an aluminium unibody chassis, fast CPU and is well-priced for an ultrabook.</p>	<p>\$2,499 www.asus.com/au This unashamedly huge 17-inch desktop replacement packs heaps of power and a GTX 970M GPU.</p>	<p>\$3,399 www.venomcomputers.com.au This impressive 15.6-inch performance all-rounder packs in an Nvidia GTX 970, 3K screen and SSD + HDD.</p>	
				<p>LAPTOPS, TABLETS & SMARTPHONES LAPTOPS</p>

SMARTPHONES
- ENTRY-LEVEL



[BEST WINDOWS]
Microsoft Lumia 635

\$180 | www.nokia.com
A simple and elegant WP8 handset with 4G. A solid entry-level choice.



[BEST BIG SCREEN]
Motorola Moto G (2014)

\$269 | www.motorola.com.au
This upgraded Moto G packs all the basics and then some; dual-SIM 3G, 5-inch 720p LCD and 8GB storage.



[BEST PERFORMANCE]
LG G2

\$449 (32GB) | www.lg.com
The G2 is basically the Nexus 5 with LG tweaks. It's sleek and fast with a 5-inch screen.



[NEW ON SHELF]
Microsoft Lumia 640XL

\$399 | www.microsoft.com
Offering a 5.7-inch screen, 13MP camera and 3,000mAh battery this big Windows Phone is equally big value.

SMARTPHONES
- PREMIUM



[BEST BUDGET]
Motorola Moto X (2014)

\$550 (16GB) | www.motorola.com/au
An excellent 5.2-inch all-rounder with frequent OS updates. Shop around for the best price.



[BEST BIG SCREEN]
Samsung Galaxy Note 4

\$949 | www.samsung.com/au
The latest Note keeps the stylus and 5.7-inch screen, but upgrades the CPU and GPU to match the latest iPhones.



[BEST PREMIUM]
Apple iPhone 6

From \$869 | www.apple.com/au
The new iPhone is slimmer, curvier and faster than ever and a great reason to stick with (or reconsider joining) the Apple team.



[NEW ON SHELF]
LG G4

From \$869 | www.lg.com/au
The new LG flagship phablet includes a stunning 5.5-inch display and optional leather back.

TABLETS
- ENTRY-LEVEL

LAPTOPS, TABLETS & SMARTPHONES



[BEST BUDGET]
Samsung Galaxy Tab 4 8.0

\$240 (16GB) | www.samsung.com/au
It's getting a little long in the tooth, but this 8-inch quad-core Android tablet is our current budget pick.



[BEST COMPACT]
Apple iPad mini 2

\$369 (16GB) | www.apple.com/au
With a Retina display, the iPad mini 2 is fantastic value if you want a small tablet with all the frills.



[BEST PERFORMANCE]
Apple iPad Air

\$499 | www.apple.com/au
This iPad recently saw a \$100 price drop, which makes it the best-performing tablet under \$500.



[NEW ON SHELF]
Microsoft Surface 3

\$699 (64GB) | www.microsoft.com
A lower-end, Intel Atom-powered alternative to the Surface Pro, but still runs the full version of Windows.

TABLETS
- PREMIUM



[BEST BUDGET]
Apple iPad Air

\$499 | www.apple.com/au
If the budget doesn't extend to an Air 2, this 2013 unit is still very competitive with the latest Androids.



[BEST VERSATILITY]
Microsoft Surface Pro 3

\$1,130 | www.microsoft.com.au
The official Windows 8.1 Pro tablet has a stylus and runs traditional Windows software.



[BEST PERFORMANCE]
Apple iPad Air 2

From \$619 | www.apple.com/au
The second-gen iPad Air goes even slimmer and lighter than before and has unbelievably fast internals.



[NEW ON SHELF]
Google Nexus 9

From \$479 | play.google.com
Google's new premium 8.9-inch tablet runs Android 5.0 and is designed by HTC.

BLUETOOTH TABLET
KEYBOARDS

GADGETS & ACCESSORIES



[BEST FOR IPAD 2/3/4]
Logitech Keyboard Case for iPad

\$90 | www.logitech.com
Offers good protection and comfy, responsive keys on a budget.



[BEST FOR IPAD AIR]
Belkin QODE Slim Keyboard Case

\$110 | www.belkin.com/au
A great keyboard and vibrant case with a kickstand make this a great option for iPad Air.



[BEST FOR IPAD MINI]
Logitech Ultrathin Keyboard Cover

\$90 | www.logitech.com
The Ultrathin combines a fantastic-quality keyboard with a metal-backed case.



[BEST FULL-SIZED KEYBOARD]
Logitech Tablet Keyboard

\$120 | www.logitech.com
If you want the full-sized typing experience, this is your best bet.

DIGITAL
CAMERAS



[BEST BUDGET]
Nikon CoolPix S3300

\$150 | www.nikon.com.au
This compact camera is available in eight colours and has an ultra-slim body with 6x wide-angle lens.



[BEST COMPACT SLR]
Olympus OM-D E-M10

\$1,100 | www.olympus.com.au
A MILC with lots of lenses, fast shooting and a high-res viewfinder at a great price.








[BEST DIGITAL SLR]
Sony Alpha SLT-A65

\$1,110 | www.sony.com.au
A fantastic prosumer camera that lives up to its great specs.



[NEW ON SHELF]
Samsung NX1

\$2,200 | www.samsung.com/au
Samsung's new MILC is turning heads thanks to some first-rate lenses, great image quality and 4K video capabilities.

 <p>[BEST POWER BANK] TP-Link TL-PB10400</p> <p>\$50 www.tp-link.com.au This 10,400mAh power bank will let you recharge your smartphone or tablet anywhere and weighs just 241g.</p>	 <p>[BEST WIRELESS HARD DRIVE] WD My Passport Wireless 2TB</p> <p>\$330 www.wd.com Take your media collection with you and play it back from Android and iOS devices with this Wi-Fi hard drive.</p>	 <p>[BEST STYLUS] Adonit Jot Pro</p> <p>\$45 www.adonit.net This one's great for scribbling notes on Android and iOS tablets and doesn't cost the Earth.</p>	 <p>[BEST MOBILE GAMEPAD] iPega PG-9025</p> <p>~\$25 www.dx.com You'll need to buy it online, but this gamepad is nice and responsive and works with both iOS and Android.</p>	<div>TABLET & SMARTPHONE ACCESSORIES</div> <div>BUYER'S GUIDE READY RECKONER</div>	
 <p>[BEST BUDGET] Toshiba Canvio Basics 1TB</p> <p>\$90 www.toshiba.com A compact portable hard drive with USB 2.0, 3.0 and backward compatibility.</p>	 <p>[BEST VALUE] Western Digital My Passport Ultra 2TB</p> <p>\$149 www.wd.com Great value, with lots of storage, good software and USB 3.0 support.</p>	 <p>[BEST PERFORMANCE] Seagate Backup Plus Fast 4TB</p> <p>\$400 www.seagate.com This speedy USB 3.0 drive transfers data at up to 220MB/s — twice as fast as most others.</p>	 <p>[NEW ON SHELF] Western Digital My Passport Pro 4TB</p> <p>\$650 www.wd.com This RAIDed unit is speedy, but only works with Thunderbolt-enabled PCs and Macs.</p>		<div>GADGETS & ACCESSORIES</div> <div>PORTABLE HARD DRIVES</div>
 <p>[BEST SMARTWATCH FOR ANDROID] LG G Watch R</p> <p>\$349 play.google.com/devices The G Watch R runs Android Wear and, best of all, it actually looks like a watch.</p>	<div>NEW ENTRY</div>  <p>[BEST SMARTWATCH FOR IOS] Pebble Time</p> <p>US\$200 getpebble.com This new colour e-paper smartwatch has great battery life and one of the most mature app ecosystems.</p>	<div>NEW ENTRY</div>  <p>[BEST FITNESS BAND] Fitbit Charge HR</p> <p>\$200 www.fitbit.com This top-end tracker from Fitbit's latest range offers heart-rate tracking and a handy display for a fair price.</p>	 <p>[BEST EXERCISE HEADPHONES] Jabra Sport Pulse Wireless</p> <p>\$250 www.jabra.com These in-ear buds connect to your phone via Bluetooth and have integrated heart-rate monitoring.</p>		<div>WEARABLES</div>
 <p>[BEST BUDGET] Dell S2340L</p> <p>\$230 www.dell.com.au A solid all-rounder, this 23-inch IPS display has deep colours and a nice narrow bezel.</p>	 <p>[BEST VALUE] Dell P2714H</p> <p>\$440 www.dell.com.au This quality 27-inch IPS unit has a resolution of 1,920 x 1,080 with an aspect ratio of 16:9.</p>	 <p>[BEST PERFORMANCE] ASUS PG278Q</p> <p>\$999 www.asus.com/au If you're looking for the best PC gaming display right now, there's no better than this 27-inch G-sync monitor.</p>	 <p>[NEW ON SHELF] AOC U2868PQ</p> <p>\$640 www.aocmonitorap.com AOC's 28-inch TN panel at 3,840 x 2,160 is the cheapest 4K we've yet tested and great bang for buck.</p>		<div>PC MONITORS</div>
 <p>[BEST BUDGET] Tt eSports Poseidon ZX</p> <p>\$99 au.ttesports.com This basic compact board still has it where it counts, with solid performance and comfortable keys.</p>	 <p>[BEST VALUE] Logitech G710+</p> <p>\$130 www.logitech.com This brown switched mechanical gaming keyboard is comparatively quiet and has great key feel.</p>	 <p>[BEST PREMIUM] Corsair Vengeance K95 RGB</p> <p>\$230 www.corsair.com Available in multiple switch colours, the K95's backlighting can be customised in almost any shade.</p>	 <p>[NEW ON SHELF] Razer BlackWidow Chroma</p> <p>\$210 www.razerzone.com Razer's joined the multi-coloured LED club, upgrading its BlackWidow with rainbow-coloured backlighting.</p>	<div>PC PERIPHERALS</div> <div>GAMING KEYBOARDS</div>	
 <p>[BEST BUDGET] Microsoft LifeChat LX-3000</p> <p>\$35 www.microsoft.com.au/hardware A cheap basic USB headset with noise-cancelling tech.</p>	 <p>[BEST VALUE] SteelSeries Siberia V2</p> <p>\$80 www.steelseries.com Luxurious with great sound and a brilliant retractable microphone.</p>	 <p>[BEST PERFORMANCE] Audio-Technica ATH-AG1</p> <p>\$349 www.audio-technica.com.au A super-comfy headset with massive drivers and fantastic sound.</p>	 <p>[NEW ON SHELF] Kingston HyperX Cloud II</p> <p>\$160 www.kingston.com These affordably-priced cans sound great across games, music and movies.</p>	<div>GAMING HEADSETS</div>	

			
[BEST BUDGET] Logitech G402 Hyperion Fury \$49 www.logitech.com A hybrid-sensor gaming mouse with optical, gyro and accelerometer tracking, this one doesn't skip a beat.	[BEST VALUE] SteelSeries Sensei RAW \$70 www.steelseries.com This cut-down version lacks frills, but gets the basics right with great performance.	[BEST PERFORMANCE] Razer Taipan \$80 au.razerzone.com A super-high-resolution gaming mouse that's actually comfortable to use.	[NEW ON SHELF] Logitech G502 Proteus Core \$80 www.logitech.com This surprisingly affordable new optical mouse from Logitech offers great tunability.
			
[BEST BUDGET] Brother HL-L2340DW \$110 brother.com.au It's black and white only, but with Wi-Fi and great text print quality alignment, very fast print speeds and cheap to run.	[BEST VALUE] HP Officejet Pro 6830 \$180 www.epson.com.au A great all-rounder that's up for both photo-printing and text documents.	[BEST PHOTO PRINTER] Epson Expression XP-720 \$210 www.epson.com.au Creates fantastic-quality photo prints at a relatively affordable price.	[NEW ON SHELF] Epson WorkForce Pro WP-4540 \$449 www.epson.com.au Requires manual print head alignment, but very fast print speeds and cheap to run.
			
[BEST BUDGET] Sapphire Dual-X Radeon R7 265 \$190 www.sapphiretech.com This beats the similarly-priced GTX 750 Ti from Nvidia for value and speed.	[BEST VALUE] Sapphire SA-R9270X-2GD5-OC \$240 www.sapphiretech.com This mid-range card from AMD can run most games with all the bells and whistles at 1080p.	[BEST PREMIUM] Gigabyte GV-N970WF30C-4GD \$490 www.gigabyte.com.au If your budget stretches to around \$500, this new GeForce is extremely fast and great value.	[BEST EXTREME] MSI GTX-980-4GD5 \$780 au.msi.com This top-tier card from MSI and Nvidia is super speedy and what we'd select if money is no object.
			
[BEST BUDGET] ASRock H97M-Anniversary \$99 www.asrock.com Built to go with the Pentium G3258, this is a solid all-rounder for under \$100.	[BEST VALUE] ASRock Z97M Pro4 \$145 www.asrock.com This budget Z97 motherboard has all the basics you'll need for an upgrade to the latest Core i5 CPUs.	[BEST PERFORMANCE] ASUS Z97-A \$210 www.asus.com/au Has nearly all the things worth caring about in a high-end board and lacks little else.	[NEW ON SHELF] MSI X99 SLI Plus \$330 www.gigabyte.com.au You'll need a new X99 board to match the i7-5960X CPU below. This is one of the more affordable options...
			
[BEST BUDGET] Intel Pentium G3258 \$80 www.intel.com An extremely overclockable dual-core CPU for those looking at building a ballsy budget rig.	[BEST VALUE] Intel Core i5-4690 \$250 www.intel.com This new Core i5 chip offers great performance with low power use.	[BEST PREMIUM] Intel Core i7-4790K \$405 www.intel.com If money's no object, buy this unlocked and overclockable super-fast chip.	[NEW ON SHELF] Intel Core i7-5820K \$480 www.intel.com For only a little more than the i7-4790K, this 6-core enthusiast chip is a top performer.
			
[BEST BUDGET] Intel SSD 530 Series 120GB \$90 www.intel.com.au A fast, reliable and low-priced SSD. A great option for anyone looking for a budget SSD.	[BEST VALUE] Intel SSD 530 Series 240GB \$150 www.intel.com.au Intel's great reliability and solid performance combine with an excellent price to hit the sweet spot.	[BEST PREMIUM] SanDisk Ultra II 480GB \$250 www.sandisk.com This reasonably-priced unit from SanDisk has heaps of space for your OS, games and critical apps.	[BEST EXTREME] Samsung 850 EVO 1TB \$540 www.samsung.com/au This successor to the 840 EVO offers the best mix of speed, capacity and price for those with big needs.



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